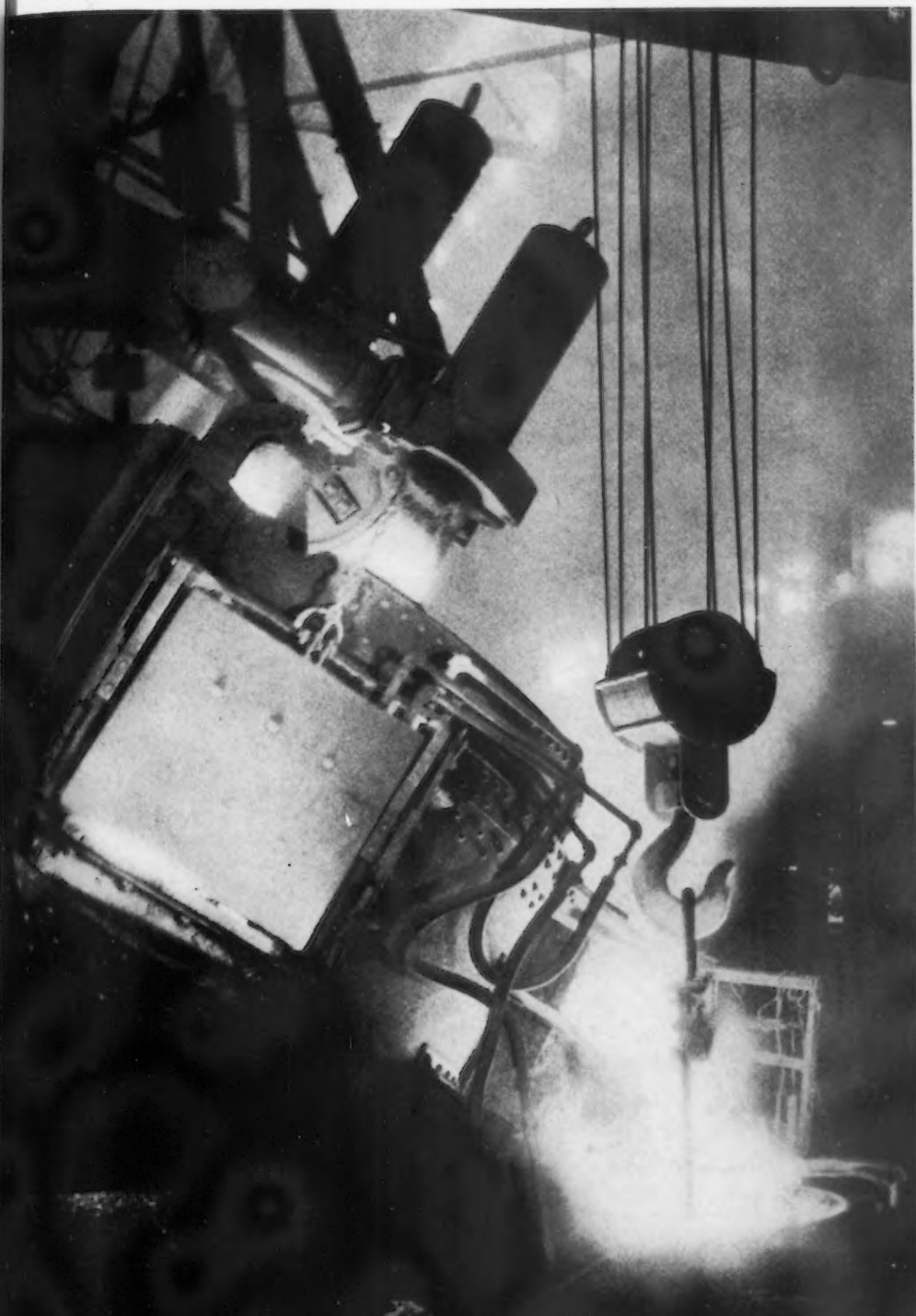


# THE IRON AGE

PRODUCTION -- MANAGEMENT

DECEMBER 7, 1933

PROCESSES -- NEWS



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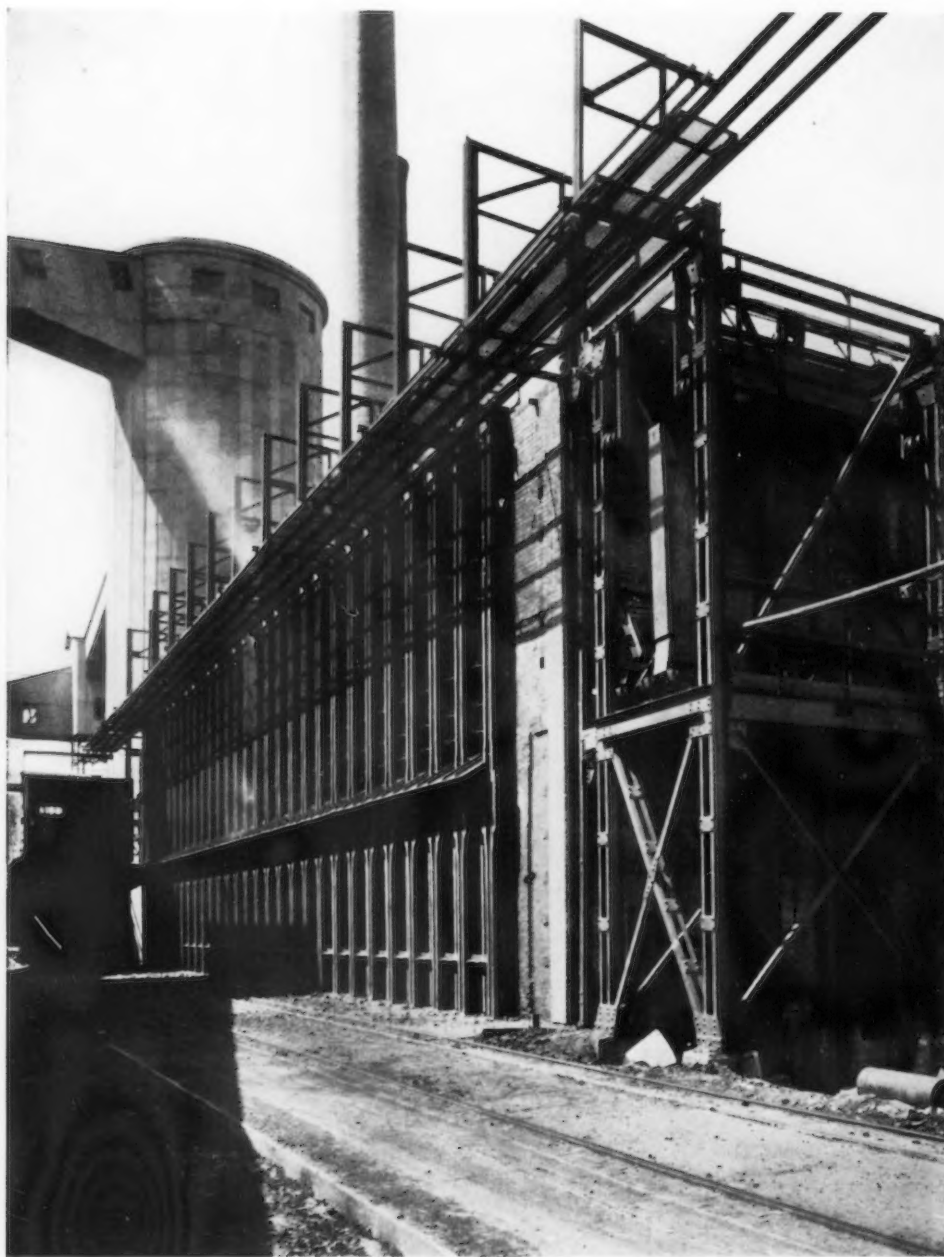


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# △△ THE IRON AGE △△ December 7, 1933 △△

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## Contents

Engineering Vision vs. Depression	11
Making Automotive Piston Rings	12
Destroying Surplus Capacity	16
Finish Helps Metal Products Sales	18
Types and Uses of Cutting Oils	22
Steel Goes Hollywood	25
New Equipment	26
News	28
Personals and Obituaries	30
Washington News	31
Automotive Industry	37
October Pig Iron Output	38
Markets	39
Construction and Equipment Buying	54
Products Advertised	96
Index to Advertisers	114

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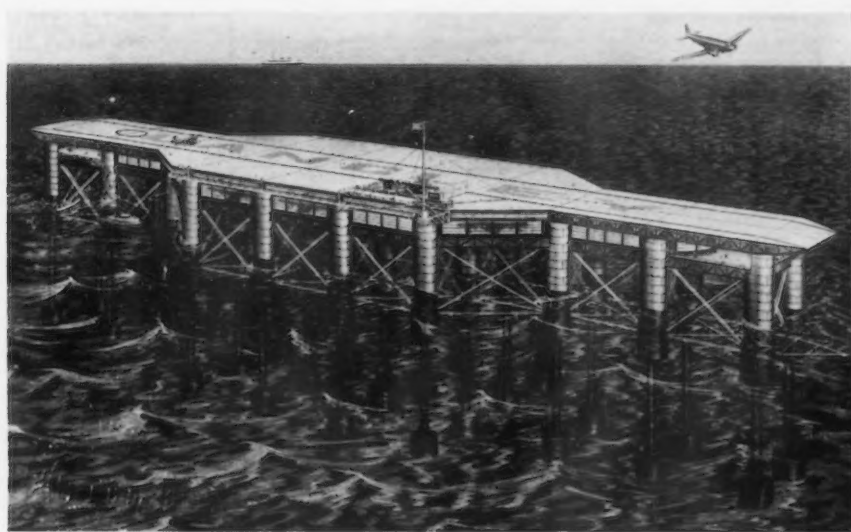
## BETHLEHEM STEEL COMPANY

# ▲▲▲ THE IRON AGE ▲▲▲

DECEMBER 7, 1933

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## Engineering Vision vs. Depression

**T**HE engineer is frequently blamed for economic maladjustment. His ingenuity in the development of the machine is said to have upset the delicate balance of the industrial structure. Critics have answered with the simple fact that without the engineer human progress would stop. And progress is essential. History offers no examples of the world's long remaining static, and retrogression has always been disastrous.

**B**UT occasionally the engineer displays vision which fires the imagination of his severest critics. The Armstrong Seadrome, developed to "bridge" the Atlantic with a chain of landing platforms for flying ships, is an example.

Not a recent conception, the seadrome idea has been a "natural" for the Sunday supplements for many years. Even when first broached, it received much serious consideration, and the basic principles were outlined in THE IRON AGE on Nov. 14, 1929. At that time, Edward H. Armstrong had attracted the attention of such pioneering organizations as General Electric Co., Sun Shipbuilding & Dry Dock Co., Belmont Iron Works, John A. Roebling's Sons Co. and Henry J. Gielow, Inc., New York naval architect. It is significant that these firms are still interested.

**I**T may seem ironic to the critics of the engineer that this visionary idea of 1929 has become a sober actuality of 1933 and now seems likely to be realized as a means of putting men to work. The Public Works Administration, in its routine disbursements of millions for sewers, post offices, waterworks, roads and irrigation projects, has been struck by the originality of the scheme.

Allocation of funds for building an experimental section of such a seadrome seems practically assured. If it proves successful, and its sponsors are certain that it will, money will be sought to build five such floating air stations to be anchored in the Atlantic. At least 125,000 tons of steel would be required, and thousands of men would be given employment. As an impetus to industrial recovery, the project would be of inestimable value. As an achievement in transportation, it would be epochal.

**T**HE idea has naturally met with much criticism, chiefly from parties whose particular interests might be thwarted. But the Panama Canal had many critics before it was built. One great country failed in the job, and it was left to the United States. It is good to know that our Government has not lost its pioneering heritage.

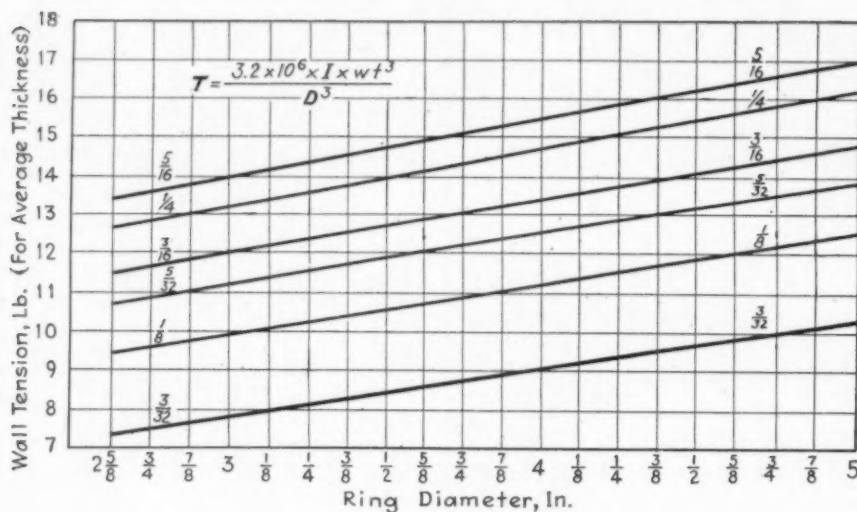


Fig. 1—Chart of Piston Ring Wall Tension.

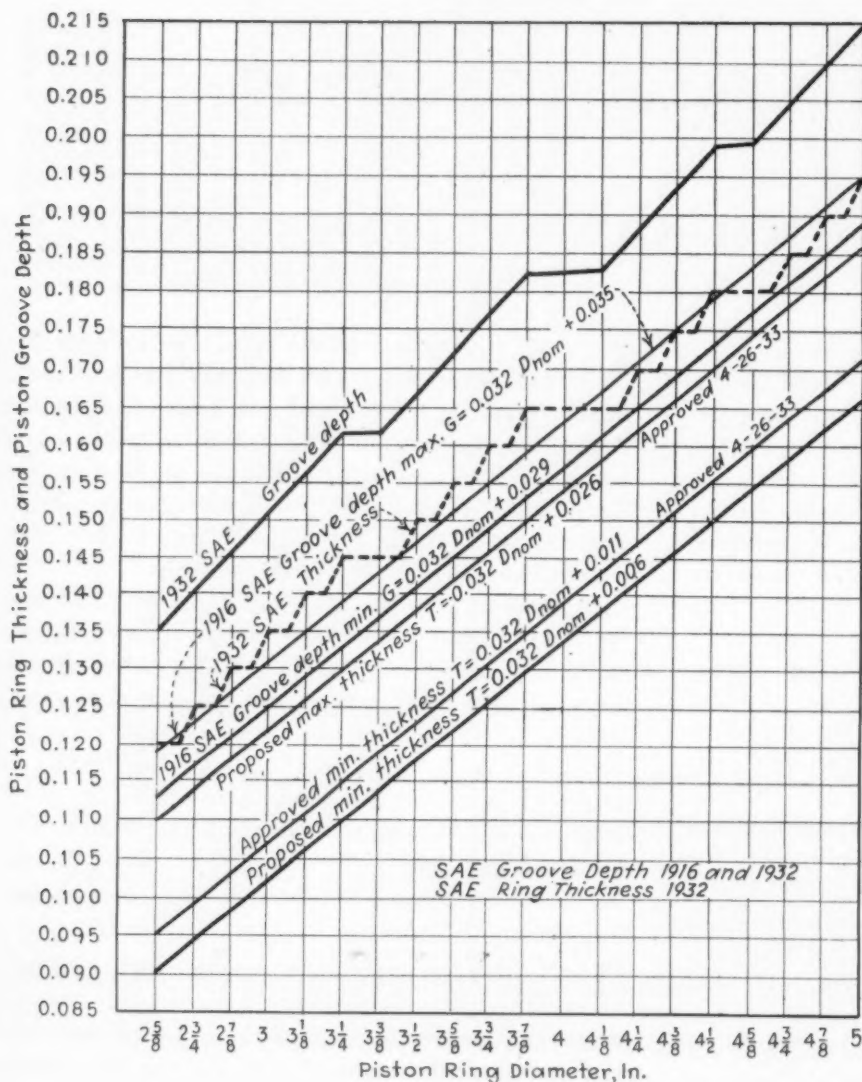


Fig. 2—Chart Showing Groove Depths and Ring Thicknesses.

# Manufacture of

By **JOSEPH H. CHEETHAM**  
Factory Manager, Chance Co.

**A**SIDE from the importance of perfect castings and correct machining, there is no other factor in the performance of a piston ring that is so vital to long, economical operation as is the tension.

By ring tension is meant the outward pressure against the cylinder walls.

As a basis for comparison, the tension is measured by closing the gap where the ring is split, in some suitable measuring device.

Too much tension is to be avoided. Its results are clearly indicated by large oil consumption, caused by excessive ring, cylinder and piston wear. Common effects of this trouble are out of round wear of both the cylinder and piston. This result calls for re-boring and re-honing of cylinder block and installation of oversize pistons.

Too little tension results in high oil and gas consumption due to too little pressure against cylinder walls. This causes the ring to ride over the oil on cylinder walls and allows gas leakage.

For these reasons, the Chance Co. has established a proper ring tension which eliminates the use of costly expanders back of the ring and excessive wear on cylinder, pistons and piston rings.

Upon investigation it was found there were no standards for piston ring tension. To obtain perfect tension, required a combination of technical knowledge and practical experience as most automotive piston grooves are made to either the 1916 or 1932 S.A.E. standards. Consideration of these standards made it necessary to consider the thickness and width of the ring as being constant factors.

After years of investigation and research, the tension curve shown in Fig. 1 was set-up as being necessary for trade requirements.

Having these known factors, the length of the insert was readily obtained by using the well known cantilever beam formula:

$$T = \frac{E \times G \times w \times t^3}{D^3}$$

# ire of Automotive Piston Rings—I

Where: T = Tension required  
E = Modulus of Elasticity  
( $3.2 \times 10^6$ ) by test  
G = Length of insert  
t = Radial thickness  
w = Width of ring  
D = Outside diameter

## Piston Ring Thickness and Width

The thickness of piston rings is governed by the S.A.E. standards as can be noted in the thickness curve shown in Fig. 2. Chance Co. has adopted a maximum piston ring thickness to be less than the minimum 1916 S.A.E. groove depth so that no installation trouble will be encountered on older models, and also that the ring will be satisfactory for the 1932 S.A.E. standard piston groove.

Piston rings have been found to fail due to too close a fit in the groove. Upon an examination of tests, perfectly designed and machined piston rings failed due to the carbon freezing the rings in the piston. This prevents a proper tension against the cylinder wall. For this reason we have adopted a clearance of from 0.0015 in. to 0.002 in. between the piston ring and groove width.

Nominal Width	Max.	Min.
3/32 in.	0.0915 in.	0.0910 in.
1/8 in.	0.1235 in.	0.1230 in.
5/32 in.	0.1545 in.	0.1540 in.
3/4 in.	0.1860 in.	0.1855 in.
1/4 in.	0.2485 in.	0.2480 in.
5/16 in.	0.3110 in.	0.3105 in.

## Insuring Proper Foundry Control

Not being satisfied with purchased castings, the Chance Co. decided to install necessary foundry equipment

**A**N automotive piston ring is apparently a very simple product. But the requirements of its use are so trying and so important that it has taken many years to develop the successful technique of manufacturing. To produce a ring which will accomplish the conservation of gasoline and oil, as well as to provide long service, has necessitated original methods in design, in foundry practice, in machining and in the control of related factors.

Chance Co., Centralia, Mo., is one of the few concerns that completely manufactures piston rings from raw material to finished product. It has required ten years of research by this company to develop the various processes of manufacture and to bring quality of product to its present high point.

In this article the author describes some of the methods and principles employed in design, pattern-making and sand control. Succeeding articles will describe molding, pouring and machining.

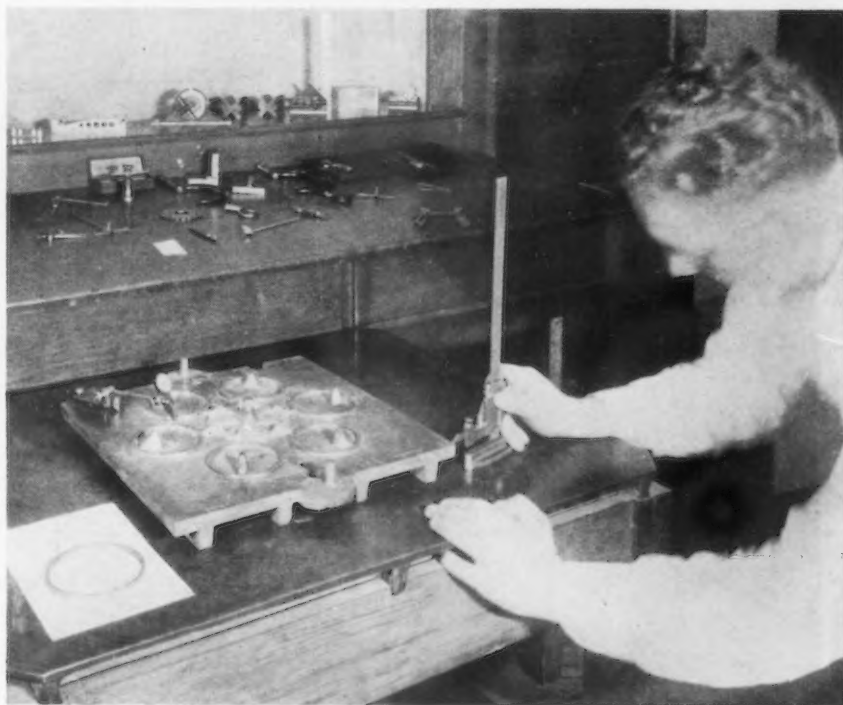


Fig. 3—Gated Pattern Plate, Showing Individual Skim Gates or Risers.

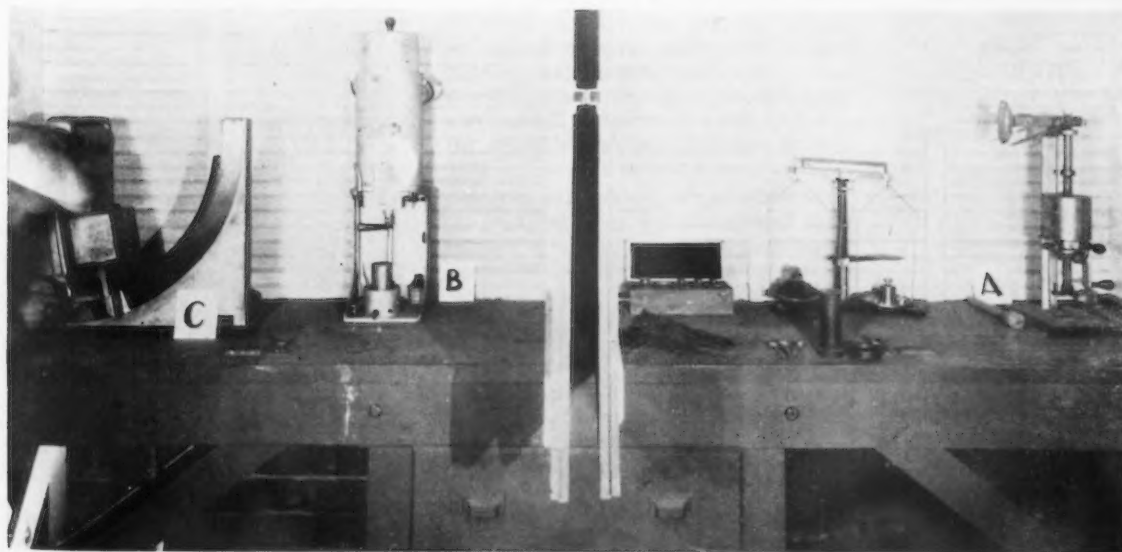


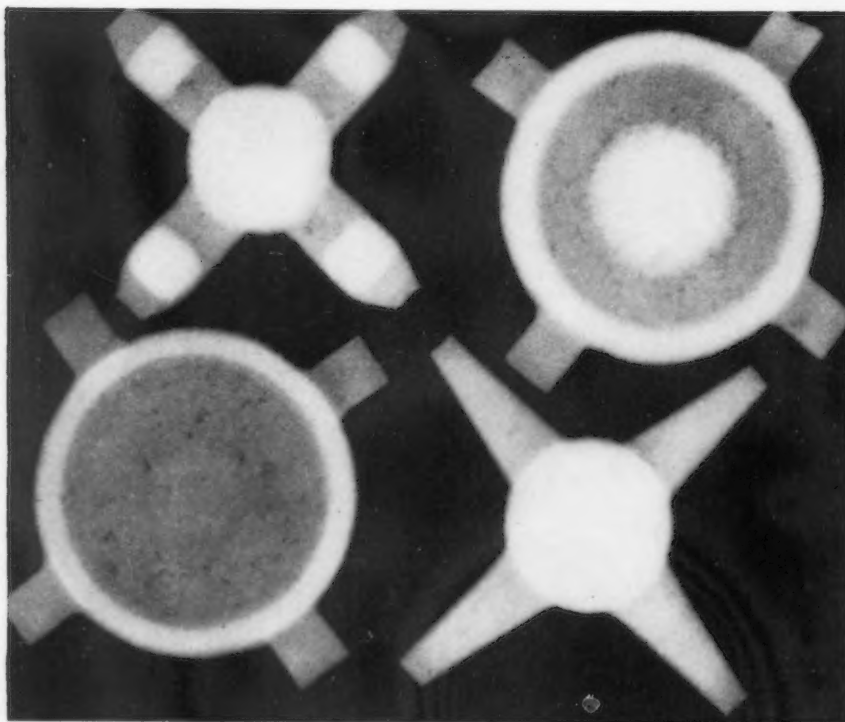
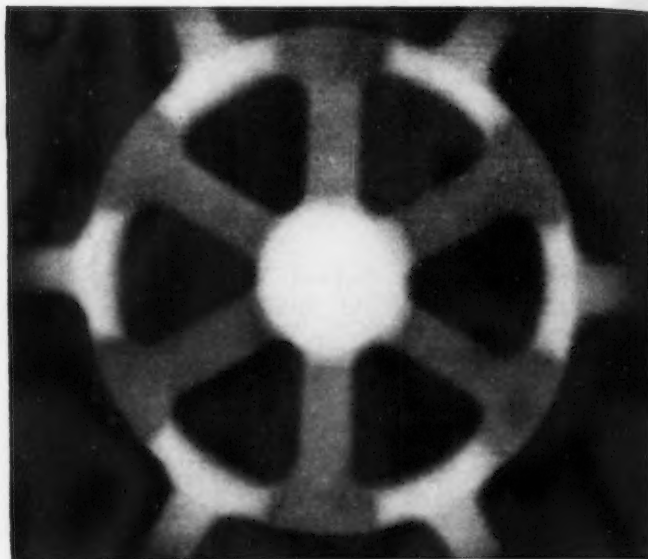
Fig. 8—The foundry Sand Testing Laboratory. (A—Permeability Tester, B—Moisture Measuring Apparatus, C—Compression and Shear Testing Machine.)

to produce its own piston ring castings. After consulting with foundry experts and metallurgists, it was realized that the molding of piston rings is one of the most difficult foundry problems known. It necessitates rigid sand control, perfect metal analysis control, expert cupola operation, as well as modern and efficient apparatus.

To cope with these strict demands, expert sand control men, experienced metallurgists, foundry executives and chemists were employed. In order for these divisions to function properly, a chemical laboratory was installed whereby analysis of the various purchased raw materials could be made, and daily chemical analyses made of different metal mixtures required for different size piston rings.

Sand laboratory testing equipment was installed. Here again sand was

▲ ▲ ▲  
Figs. 5 and 6—X-Rays of Piston Ring Gates, Showing Impurities and Trapped Gases.  
▼ ▼ ▼



purchased according to analysis for colloidal clays, proper mesh grain sizes, permeability, strength, etc., to meet the fine foundry requirements for the molding of piston rings.

Specially designed cupolas were installed, by the operation of which the elements could be controlled to reduce the influx of undesirable foreign substances such as sulphur, oxygen, etc., to a minimum.

Raw material of the highest type obtainable is purchased to an exacting analysis. This requires a survey of many blast furnace products. Coke and limestone are also purchased with equal care so that the undesirable foreign elements will not enter into the piston ring castings.

First class piston rings must be made from accurately made patterns. With poor patterns, regardless of the

quality of raw materials or machining, a first class product cannot be made. We have found that piston rings cut from a spool have a short life and are not uniform. Therefore, it was definitely decided to make individually cast piston rings.

To make perfectly true piston rings, it is first necessary to turn the patterns from a close grain semi-steel casting to the true diameter required. The pattern is then split and expanded on a gage to insure even expansion and an insert equal to the length of the gap on a finished ring (which is one of the factors controlling the amount of tension) is added. This is pinned and soldered into place. The patterns are then mounted on highly polished semi-steel plates as shown in Fig. 3. This work is done by expert tool makers.

The center wheel-shape part which joins the separate piston ring patterns, as shown in this illustration, is the "gate" through which the metal is poured in the center of the mold. After months of scientific research (through the aid of a metal X-ray machine) it was found that the metal should not flow directly from the sprue into the casting. Therefore it was found necessary to break the flow of metal so as to trap loose sand and gases. The sand and gases rise to the highest point of the mold. It can be readily seen that a small skim gate or riser adjacent to the ring casting was installed for this purpose. X-ray

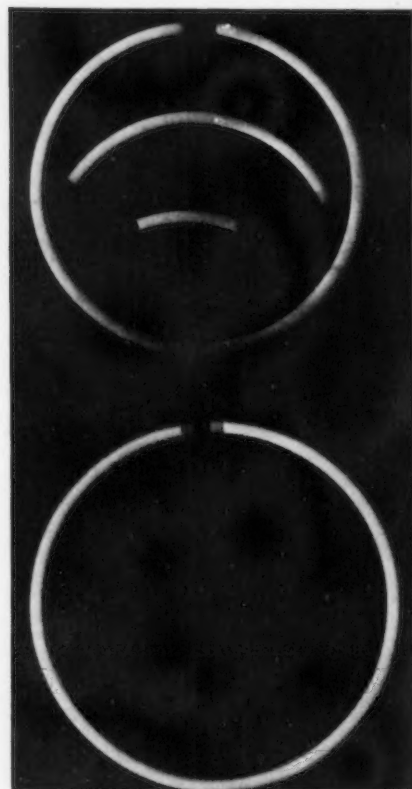


Fig. 7—X-Ray of Piston Rings, Showing Effect on Quality of Improved Methods of Gating.

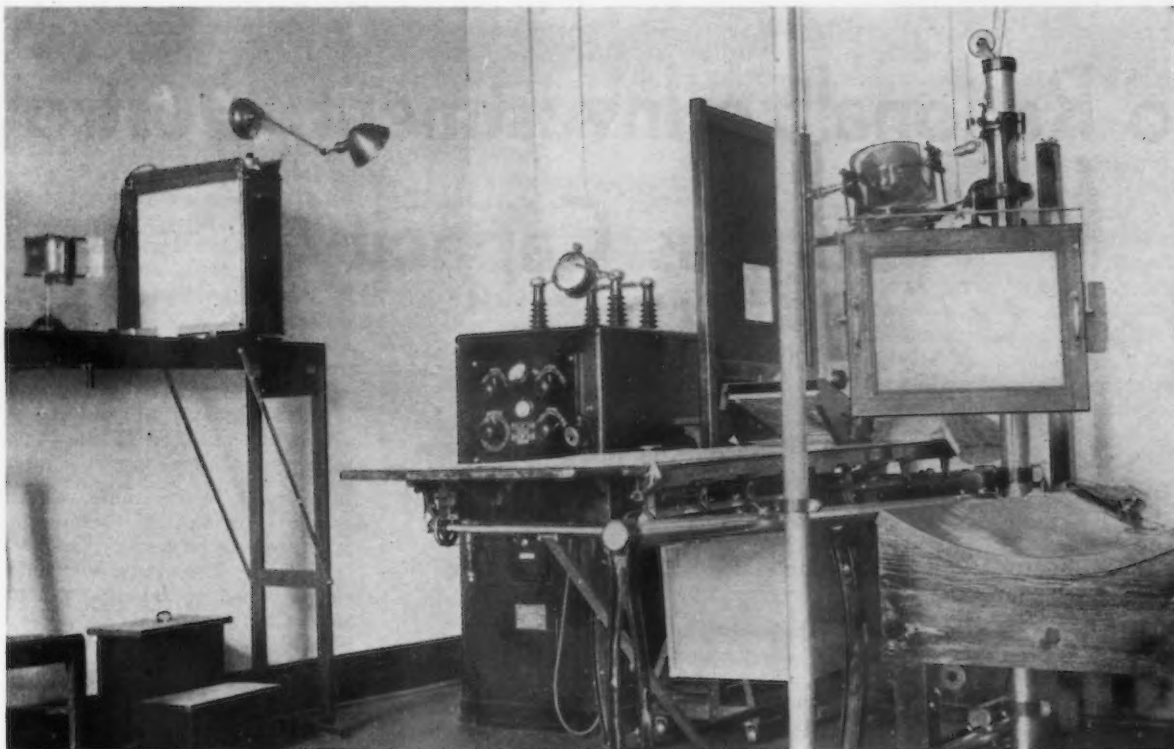


Fig. 4—X-Ray Laboratory. (Important discoveries were made here relating to foundry control.)

pictures shown in Figs. 5 and 6 show trapped gases and sand. The small square shaped object inside the ring pattern and opposite the gate is called the "bob" or "pollywog." These were found to be indispensable as they retain the heat on the opposite side of the hot metal in the gate. This eliminates hard spots and mis-runs. These bobs are later used in the tumbling mills to clean castings.

#### Sand Control

We found that local sands were not best for the manufacture of piston rings. They would break down readily, and would not free themselves of the steam and gases caused by molten metal against the damp sand. This would cause the metal to absorb the steam; thereby oxidizing and chilling the castings so they could not be used for piston rings.

The sand laboratory apparatus includes a permeability machine which registers the rapidity with which the sand will free the gases during the time of pouring the mold.

Another machine allied to the sand laboratory is a moisture machine which registers the amount of moisture in the sand. Molding sands are tested twice daily for moisture. Should the sand be too dry the sharp edges at the corner of the piston ring mold crumble away.

These particles will entrap themselves in the interior of the castings—sometimes not discernible until in use. It is also necessary to limit the maximum moisture as sand too wet

will create an excessive amount of steam in the mold. Unless the permeability of the sand balances the amount of steam created, steam will be trapped in the mold and oxidized and chilled castings will result.

Another machine vital to the sand laboratory equipment is a compression and shear testing machine.

It is quite obvious that sand in a mold must hold its shape and have the proper bond content. This is con-

trolled by the per cent of clay and moisture. As the compression strength of sand is close in proportion to the shear value, we check daily the strength of the sand through shear test.

Rather than lock the barn after the horse is stolen, every floor of molding sand is tested before molders are allowed to use it and necessary items are added to insure a minimum loss in production.

## Favors Small Industrial Power Plant

COOPERATION between industrial and public utility power plants was urged by H. D. Harkins, power design engineer, E. I. du Pont de Nemours & Co., Wilmington, Del., in a paper read before the American Society of Mechanical Engineers. The steam flow to industrial plants is of such magnitude, he said, and the industrial plants are so located that the larger part of



future electrical generating capacity should be installed in or near industries. Industrial management, in his opinion, must be educated in the apparent paradox that small-scale "back pressure" power generation is more efficient than the "quantity production" in condensing central stations. Modern technical developments, he went on to say, in higher steam pressures and mercury-vapor cycles make available more and more surplus electrical energy from industrial steam flow and this technical development favors the generation of electricity in connection with industrial processes. Sales efforts of public utilities which are directed toward the prevention of industrial-plant generation he criticized as unfair competition and unsound economics. The capacity of electric generators installed in industrial plants is, he said, at least 28 per cent of that installed in public utility stations.

# To Rationalize Investment, Destroy Surplus Capacity

By H. P. LOSELY

**W**HY is it that Mr. Shuffleman, who buys securities, can borrow money in Wall St. at less than 1 per cent, while Mr. Forsyte, who owns a large industrial plant, wants to see a promised return of 100 per cent before he will borrow to buy new equipment? In the answer to that question, there may lie an explanation to much of the current difficulty in effecting an expansion of credit. In more final terms, this wide gap points to one of the major obstacles to team-work for recovery.

It is of course obvious that the two conditions of borrowing are quite different. Mr. Shuffleman gets call money on a "cut-and-run" basis, with high liquidity and ample margin essential conditions of the loan. The proceeds of Mr. Forsyte's loan, spent for machinery, at once lose liquidity, so that the investment is conditioned by uncertainties. So, if Mr. Forsyte contemplates replacing some machines by newer models, even though they may have a proven superior economy in operation, he first discounts the savings by a safety factor, then considers the possibility of their being idle and so no use to him, and then the further chance that next year he may be able to buy a still better machine, perhaps for even less money. And as long as he has not enough confidence to make the change, the mechanics who are ready to build the machine are minus their regular jobs, and the Forsyte employees go on using the inferior machines, and so produce less wealth than they might.

Under such circumstances, it is futile to rail at bankers for refusing to lend funds which the Forsyte fraternity does not even want to borrow. Of course there are many who wish to take greater risks than are justified, and if the banker sees that granting loans in such quarters merely jeopardizes other credits which are now safe, he is only following good banking practice in refusing the loan. If the deadlock is to be broken, some means must be found to engender confidence in a rational program of new capital investment. Then our Forsytes will again willingly use their credit and next we will need to guard against

abuse of it in a sudden reversal of mood.

## Capital Goods and Prosperity

There is a wide-spread belief that prosperity will not return until there is high volume of investment in capital goods. We need not debate which is cause and which is effect; if we define prosperity as a state of expanding national and individual wealth, of which increasing investment in productive equipment and wide-spread improvement of housing facilities are tangible evidence, then we may perceive two cardinal conditions which must be met before a full revival can be expected. First, we must have a sufficiently high valuation of human skill and effort. Second, there must be greater security against impairment of capital values.

The effect of low human valuation was brought home to the writer very forcibly several years ago when doing some re-organization work in a large European factory. Time after time, we would figure on using some of the more advanced American machines, only to find that human labor was so cheap, it didn't pay to save it. When wage scales are arbitrarily lifted and

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**R**EDUCING the operating hours of machinery, says the author, does not tend to build up wages or volume stability. On the contrary, it penalizes the efficient units to make jobs for the obsolete ones.

It would be far better to wipe out the obsolete and inefficient industrial units and let the efficient ones become prosperous.

Surplus capacity, believes Mr. Losely, should be bought up by the industries concerned, and destroyed. And to prevent a new surplus of obsolescence from emerging from the ashes of the scrap pile, he proposes a "competitive franchise system."

▼ ▼ ▼

labor made worth more, whether by code, strike or Lewisonian ukase, it may seem to be a species of bootstrap levitation. The actual economic process is however rather analogous to the jacking and shoring of a structure; if properly done, in proportion to technological progress, it is a feat quite within the limits of engineering possibility.

We have, however, to contend with a feeling against the use of labor-saving devices which has recently become rather prevalent. As I endeavored to show in a recent article in THE IRON AGE, this feeling, while quite irrational, has a modicum of logical basis when the technological gains are misapplied. Over the long-term period, it must be obvious that saving labor adds to wealth, providing the labor released is then constructively employed elsewhere. Under normal conditions, a saving in one place creates additional demand in another. Either the savings are passed on to the consumer, freeing that much purchasing power for other goods; or wages are increased, giving workers greater purchasing power; or the savings are retained by the machine-owner and normally spent, either via the dividend route or for further plant improvement. If, however, the last alternative becomes too preponderant, so that nearly all the proceeds of labor-saving devices are continuously re-invested in more machinery, then technological progress becomes barren and loses its attractiveness. Interpretation of the manufacturers' census figures gives us a quantitative indication that industry generally went much too far in this latter direction. By the middle of 1929 the futility of our industrial competition for superior manufacturing armament became widely apparent—profitless prosperity was the term—and investment in producer goods began to lose its popularity.

## A Rush for the Exit

Our present impasse is in no small part due to a sudden reversal of style. We had a concurrent attempt to get out from under and convert fixed assets into cash, in ignorance of the fact that less than 2 per cent of the world's

wealth is in the form of precious metal bullion and in a failure to realize that geological conditions commercially prohibit any sudden increase of the supply (even a 3 per cent annual increment to gold stocks is quite difficult to attain). Hence, in an attempt to achieve an impossible degree of liquidity, we drove our workers to a fruitless search for gold. Instead of the classic iron law of wages, we have the law of the slaves to gold: The wage of the outcast hireling will be lowered to the yield of the poorest goldfield needed to satisfy the world's gold-hunger. And we have got down to yields of \$10 a month. So it may be said that the crying need is for a restoration of confidence in capital investment and a consequent abatement of the craze for liquidity. Then we can take back our workers from 30c a day gold-mining and put them at \$10 a day construction.

#### Let's Examine the Rules

However, neither reasoned exhortation nor emotional ballyhoo can restore confidence. We need to examine the rules by which the game has been played. If it is the rules which have made play unattractive, now is a good time to change them so that the players will come in again. It will help if we first look at the outline of the industrial process.

In the last analysis, merchandise is nearly 100 per cent the product of labor, the original appropriation of crude raw material from nature being only the smallest part of the final product. But the method of organizing this labor is of decisive influence on the final cost. Efficient mass production requires that labor first be expended on design and manufacture of tools and their housing, before commencing actual operations. It is in any case a delicate question of management economy to decide how far to go with this preliminary investment of labor. If too little is spent on preparatory organization, there will be a heavy expenditure of direct labor per unit produced. If the preparation is too elaborate, the direct labor cost may be exceedingly low, yet recovery of the initial investment impossible from sale of the product. Judging by observation and taking part in corrections of investment ratios in a fairly wide range of industry, the following general orientation leads to maximum economy: The minimum overall expense of converting materials bought into merchandise sold is attained by allotting as follows: Direct labor 50 per cent; equipment, rent and obsolescence 32 per cent; management (incl. clerical) 18 per cent. The exact figures vary several points according to the industry, but have in the past been of this approximate order. The more permanent and stable an industry, the greater the allowable safe investment and the lower the percentage of direct labor will be—and, incidentally, the greater the ease with which

high wage rates may be supported. Those who oppose labor-saving machinery should pause to realize that high wages can only be paid continuously when the production process itself is competently organized and operating under stable conditions.

This requirement of stability and security needs emphasis. If the organization of the producing unit is continuously exposed to threat of stoppage of the flow of work it will obviously be less attractive to either owner, management or lender to invest in much new equipment, or to place operations on a basis of intense economy. The intangible investment of elaborate organization, with its researches, designing and experimentation, is often as important and almost as costly as the physical equipment. The mere threat of broken continuity is sufficient to discourage the creation of those conditions by which alone high wages based on liberal investment become practically possible.

#### Organizing for Volume Stability

What industry needs, then, is some form of organization of its own procedure which will provide a much greater degree of stability of volume to each of its own members, so that each may develop its own set-up to optimum effectiveness. Recently adopted procedure on cartel lines, by universal reduction of operating hours for machinery, does not fulfil the conditions; that procedure penalizes the efficient units to make jobs for the obsolete ones. It would be far better to wipe out the obsolete and inefficient and let the efficient become prosperous.

One of the major obstacles now confronting the Recovery Administration can hardly be surmounted unless we resort to precisely such a clearance operation. Inasmuch as this point is of vital importance to the steel and machine-building industries, it is worth a slight digression to outline it. Referring again to the manufacturing census, we find that there has been for years a remarkable difference in the wages paid in different industries. For example, the average wage for the year 1929 to 1.7 million wage-earners in textiles was \$1,010, and to 0.9 million in the woodworking industries, \$1,060. Iron and steel and machinery, on the other hand, paid in the same year to almost 2 million workers an average wage of \$1,530. Year-by-year calculations of the value added



in different industries per worker employed indicate that it is in the high-pay industries that technological gains are the most pronounced.

#### Mechanization and Wage Rates

Obviously, more effective mechanization of the backward industries would provide an enormous stimulus to our near-dormant machine-building trades. But of more lasting importance, it should bring with it much higher wages in the heretofore low-wage industries and so follow up the original impetus by opening up a huge permanent market for equipment in millions of homes. The question is, can we crank these low-wage industries off the dead center where low wages discourage investment in new machinery, and lack of mechanical progress has made higher wages impossible? If the Recovery Administration should attempt by fiat to raise the low minima in these industries—and it is noteworthy that the President in signing the cotton code made lengthy comment on the low rates—there would at once be the ancient management problem of meeting the pay-roll. It can only be done by abandoning obsolete equipment; some disturbance of vested interests is unavoidable. As one feasible way out of the dilemma, with some compensation for the disturbance, yet finally arriving at true economy together with greater safety for investment, it is suggested that the licensing provisions of the Recovery Act might be used to inaugurate what I would term a "competitive franchise system." This is briefly outlined as follows:

#### Self-Government by Council

Where an industry can organize itself with a central planning council to forecast demand—and that is generally possible with fair accuracy in the major industries—such industry should proceed to eliminate useless equipment and prevent the installation of excessive productive capacity. The necessary steps would be:

- (a) Forecast probable demand under most favorable conditions, preferably in terms of machine-hours' production required each month.
- (b) Determine the available capacity in machine-hours, on the basis of 70 hours per week (except continuous processes) for existing serviceable equipment. The 70-hour week is selected as normal, since it usually permits optimum operation of two shifts, each with normal sleeping periods, and allows temporary expansion of hours for seasonal needs.
- (c) Make a tentative reconciliation of peak-loads, with the objective of securing maximum employment stability, using a few 90-hour weeks, mostly 70-hour, and some 35- or 40-hour weeks, with alternate weeks lay-off for each shift

(Concluded on Page 60)

# How Attractive Finish Helps Metal Pro

By ROBERT W. MITCHELL, Ph.D., and HERBERT R. SIMONDS

**A** MANUFACTURER of metal products naturally wants to know whether his cleaning costs are too high. He also should be interested in whether they are too low. It may be that a better cleaning job would result in a more salable product, and from this point of view too great economy in cleaning may mean extravagance in manufacturing. Until recently, cleaning too often has been considered a necessary evil in the metal working industry, and even now the sales advantages of good cleaning are frequently overlooked in the scramble for lower production costs. When a manufacturer has assured himself that he is doing as good a cleaning job as he should, from a sales angle, it then is entirely fitting for

him to try and find a less expensive way of doing the same quality of cleaning and this article is intended to tell him of some of the economies found in actual cleaning practice. Today in industry it so happens that some phases of activity have been developed from an efficiency or labor saving point of view far more than other phases, and this means in turn that there are now greater opportunities for effecting savings among such phases of activity as have been neglected.

One of the divisions most frequently overlooked by those studying plant operating economies is unquestionably the cleaning department. Equipment, materials, and methods are continually changing and improvements and

innovations in cleaning processes develop just as in other lines. Some of the items considered merely as theoretical possibilities as late as 1929 have since become established as routine practice.

## Compounds of the Future

Electrolytic cleaning in soap baths, electrolytic acid cleaning, vapor degreasing, the use of solvent soaps and of so-called wetting agents are examples of recent developments. Today new materials which were commercially unknown in 1929 are struggling for recognition and many are destined to become part of the cleaning practice of tomorrow. Some of these are the alkylated naphthalene sulphonic acids, the sulphonated fatty alcohols, the naphthenic acids from petroleum, the orthosilicates, and the sodium metaphosphates.

Cleaning is intimately associated with both preceding and subsequent operations and therefore it must be studied in relation to the complete production problem at any given plant. The nature of the dirt to be removed is dependent upon the nature of the operations which make cleaning necessary and the dirt encountered in metal working is so variable that it is impracticable to formulate any definite or close classification. Yet some determination of the nature of dirt is important.

## Study Nature of Dirt

Most engineers study samples of the actual dirt encountered, by trial with various types of cleaning compounds. If the dirt is difficult to clean, or if its proper cleaning requires a specific compound, it may be that use of different slushing oils, cutting oils or drawing lubricants in machining previous to cleaning will so change the nature of the dirt that it can be either cleaned more easily, more thoroughly, or cleaned with lower cost compounds.

An example of a common problem will help to illustrate this. Straight mineral oil is not saponifiable nor can it be emulsified by a solution of plain alkali. Most industrial lubricant compounds are mineral oils containing

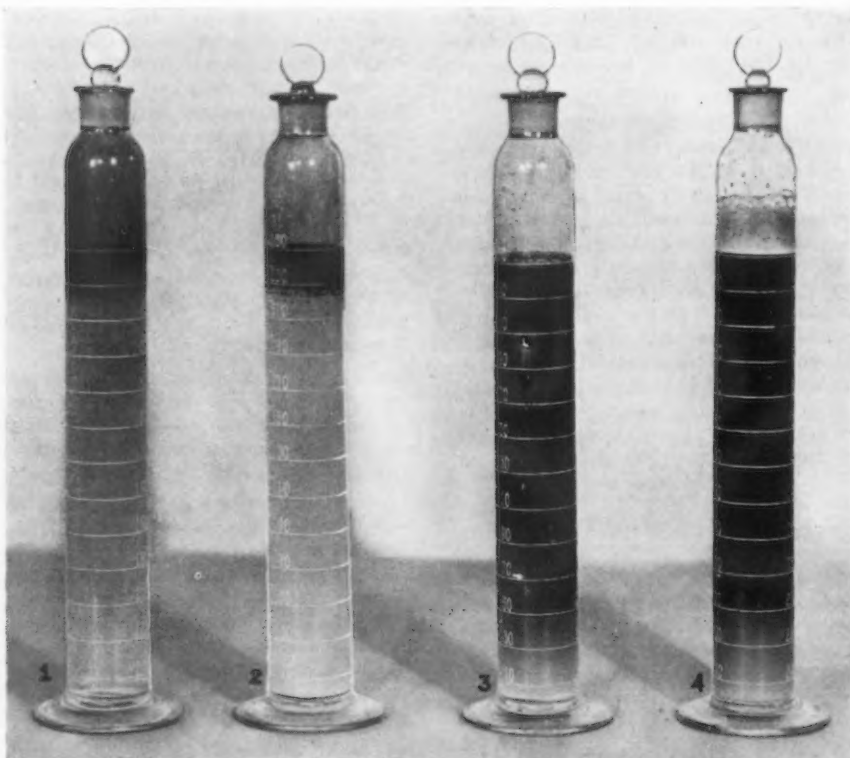


Fig. 1. Identical samples of grease composed largely of mineral oil were placed in these four cylinders, together with four different cleaning compounds. They were shaken and allowed to stand, and the appearance as shown gives an indication of the relative effectiveness of the cleaning agents. The sample at the left (1) shows no emulsification, and the oil sticks to the sides of the glass cylinder; (2) indicates no emulsification but less adherence of oil to the vessel; (3) shows good emulsification and no foaming; (4) shows excellent emulsification, no adherence of oil, but some foaming.

## 4—How to Minimize Cleaning Expense

small amounts of fatty oils or their derivatives, and the latter are saponifiable with alkali, forming soaps. Soaps will emulsify mineral oils and therefore it is possible to clean with caustic or soda ash, both of which are inexpensive. Such a process, however, is slow and incomplete because the soap forming process itself is slow and the amount of soap thus formed is usually inadequate for the prompt and complete emulsion of the mineral oil. Because of these difficulties, special compounds have been developed to penetrate between the oil film and the surface to be cleaned. These compounds already contain some soap or other wetting agent.

### Testing Compounds

Certain preliminary tests often give indications as to suitability of cleaning compounds. By shaking 10 c.c. of the oil or grease to be removed together with 90 c.c. of cleaning solution, and noting the ease of emulsion, completeness of emulsion, and stability of emulsion, judgment may often be passed as to whether a cleaning material will or will not function on a large scale. Several different materials may be compared in this way by making up a set of emulsion tubes and shaking them all together.

An accompanying illustration shows one such test. In four tubes were placed four different cleaning compounds and four identical samples of mineral oil. All were shaken uniformly and simultaneously and allowed to stand a few minutes at which time a photograph was taken. Emulsification is clearly shown.

The same kind of a test may be made to indicate the effect of the cleaning material in suspending solid-particle-dirt. Weighed equal samples of the dirt may be put in each of the tubes and shaken with the cleaning solution, and the effect of the latter in breaking up and suspending the dirt noted. Some large users of cleaning materials who buy on specification use this testing method and they carry it further. The initial cleaning solutions which are being compared are progressively diluted with water and their emulsifying and deflocculating

powers with the solid-particle-dirt compared. This, to a certain extent, gives a measure of the lasting power of the solution.

### Test for Discoloration

In comparing emulsifying ability, it is a good plan to take several sample tubes being compared, hold them all together uniformly, either in a clamp or by hand, and shake, say 10 times, and note the quality of the emulsions produced; then shake 20 times and compare, and then shake thoroughly until all samples are emulsified, and allow to stand, and note with a watch the different times of separation. These tests are best made at a temperature of around 140 deg. F. because with a higher temperature there will be trouble with the stoppers blowing out of the tubes when shaking.

In the cleaning of aluminum, zinc, or die cast metal, a small preliminary test in the beaker or bucket will gen-

THE accompanying article, fourth in a comprehensive series on metal finishing, tells how some manufacturers have made substantial savings in cleaning expense by adopting modern methods and equipment.

The series is being prepared under the direction of Mr. Simonds for The Iron Age. Dr. Mitchell is technical director, Magnus Chemical Co., Garwood, N. J.

erally allow a sound conclusion to be drawn concerning the suitability of the cleaner in question from the angle of corrosion or discoloration of the metal.

### Labor is Biggest Item

It has been said, with a great deal of truth, that 95 cents out of every cleaning dollar goes for labor and overhead. This percentage, of course, varies with different jobs but in the average case the labor is the biggest single item of expense. It is, therefore, most important, in establishing a cleaning process, to carefully select that cleaning material and method which will keep the other more expensive factors to a minimum.

Actual yearly cost figures from one large plant are:

Labor .....	\$16,476.00
Water (including rinsing) ..	1,597.00
Cleaning compound .....	1,183.00
Other items (inc. steam) ..	500.00

On an average, an efficient metal cleaning solution preparing work for

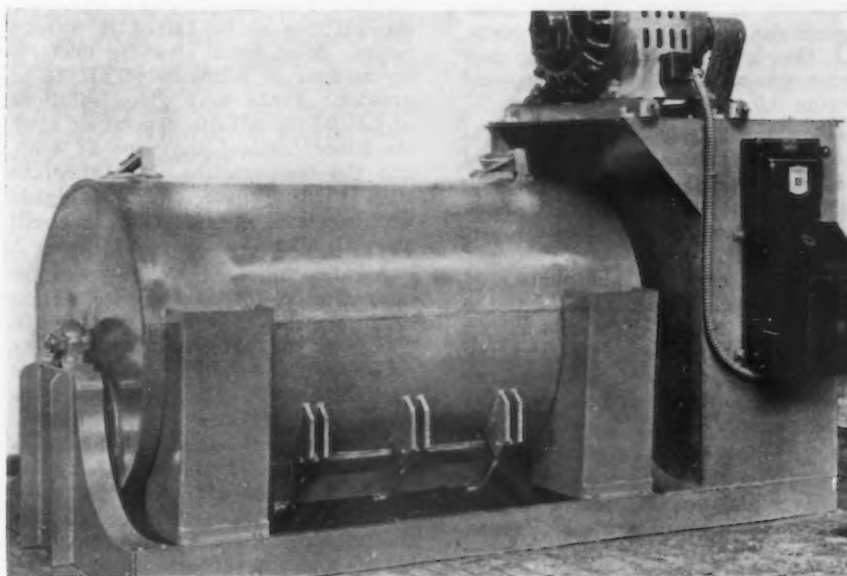


Fig. 2. This semi-automatic barrel completely replaces former scratch brushing and pickling at a former cost of 29 cents per dozen shovel blades. The tumbling operation costs approximately 7 cents per dozen shovel blades of the same type. The barrel is loaded at the sides with the tumbling compartment empty. Rotation causes the pieces to come in from the end compartments to the center or tumbling compartment. Rotation in the opposite direction causes the cleaning stars to return to the outer compartments so that the work may be dumped from the barrel without loss of stars.

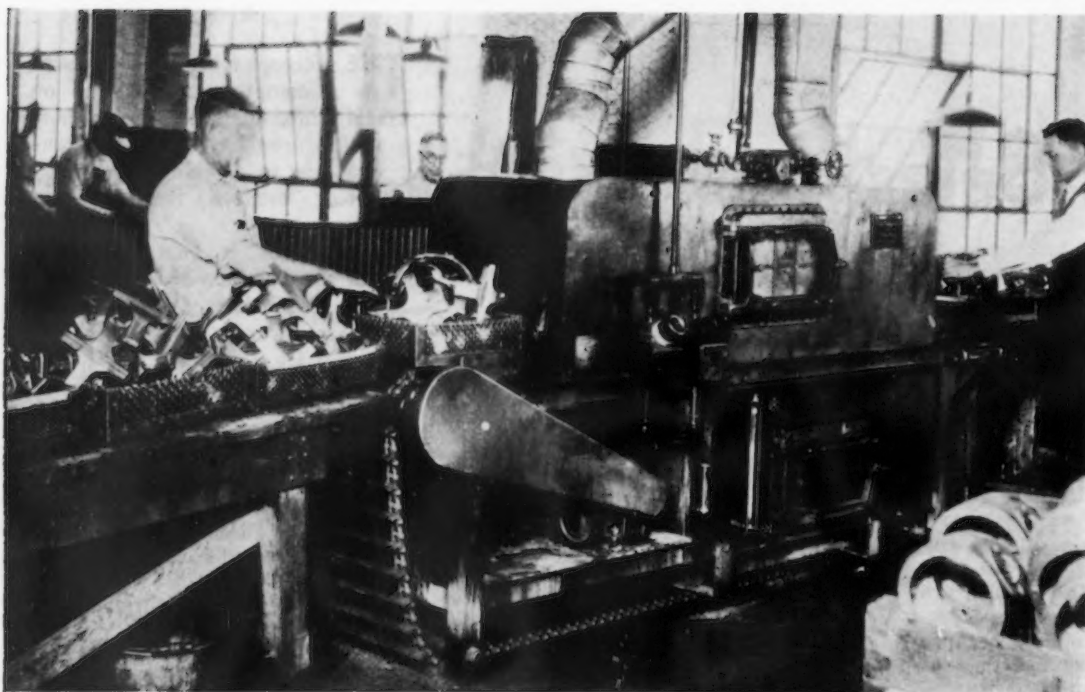


Fig. 3. Bronze castings for coffee grinders and mixers are cleaned on a belt type of semi-automatic washer. The machine has a solution capacity of 100 gal. and this is kept effective by the addition of 1 lb. of cleaning compound per day. The compound is added by merely placing in one of the wire mesh baskets. No subsequent rinse is necessary.

electroplating or similar finish, should clean 900 or more square feet per pound of cleaner. This applies to heavily loaded work in still tank cleaning. In electro cleaning or in mechanical washing machines, up to 1000 sq. ft. per lb. of cleaner may be obtained. In a recent competitive test in one of the largest plants in the East, cleaning material costs per 1000 parts ran between 20.6 cents and 27 cents. The parts were pressed steel panels and box tops (averaging a little less than 2 sq. ft. each) coated with mineral oil. These were anodically cleaned in 3 min. in a boiling solution containing 6 oz. of cleaner to 1 gal. The cost of various cleaning compounds ran from 6 cents to 12.5 cents, but the lowest total cleaning cost figure was achieved with a compound costing 9.5 cents.

In a recent letter from N. Ransohoff, Inc., large manufacturer of metal cleaning machinery, the following statement is made concerning some of the technical aspects of this work: "Investigation showed our customer was using trisodium phosphate and soda ash which were not suited to the principal of the mechanical washing machine we furnished. By changing to a specially designed compound we were able to reduce costs by some \$3,600 a year."

In cleaning tripoli from nickel silver flatware before electro cleaning for silver plating, 2000 pieces may be cleaned with a pound of soap. Beyond this the solution becomes so loaded with dirt that cleaning is too slow and not complete. The cleaning operation averages 20 min. and the parts are all carefully hand packed in and out of the cleaning baskets to avoid scratching. Cleaning compound cost on this operation is one of the least important factors. Labor

charges and certainty of cleaning are the factors watched.

A steel company a few years ago decided to give its rivets added sales appeal by means of a better finish. A process of automatic cleaning and barrel burnishing rivets of all sizes was worked out which produced a clean, bright rivet that looked almost as though it had been individually polished. The expense per rivet was extremely low.

#### Proper Alkalinity

Ordinarily, to sufficiently reduce interfacial tension between oil and a cleaning solution for rapid emulsion, the pH has to be raised to a high figure. Most metal cleaning preferably is done in solutions of pH 12 or greater. Plain soap gives solutions of pH 9.5 to pH 10, depending upon the concentration, the type of soap, and the temperature. To bring the soap to the more effective higher working level it is fortified or built up with alkali.

Alkaline silicates probably are the most effective for this purpose. Their alkalinity is of the buffered type. That is, they release alkalinity to their solutions only gradually, and progressively. When dissolved, a small part of their "bound" (chemically combined) alkali is released to the solution as free alkali. It is this which raises the pH or the degree of alkalinity of the solution. As this free alkali is consumed or neutralized by the cleaning process, more of the combined alkali splits off into the water thus maintaining the balance of the solution in the proper cleaning range until the solution is exhausted.

Caustic potash or caustic soda, and phosphate, are often combined in these buffered, built-up soaps to achieve

certain desired results. The silicates have an added advantage in that their solutions possess colloidal properties which appear to augment the colloidal properties of the soap in deflocculating and holding dirt in emulsification and suspension. Phosphates are particularly valuable where metathesis with insoluble lime compounds in the dirt is necessary, as in removing lime-soap greases.

The type and amount of soap used is of importance. Only relatively small percentages of soap can be used in cleaning solutions and it must be of a soluble, free-rinsing type, either of low titer, or of sulphonated oil, stock. Many soaps have poor solubility in solutions of high alkalinity. Tallow soaps, laundry soaps, or the ordinary hand soaps are entirely unfit for metal cleaning.

#### Save Pennies and Spend Dollars

By designing manufacturing processes to use lubricants and cutting compounds which have a high per-

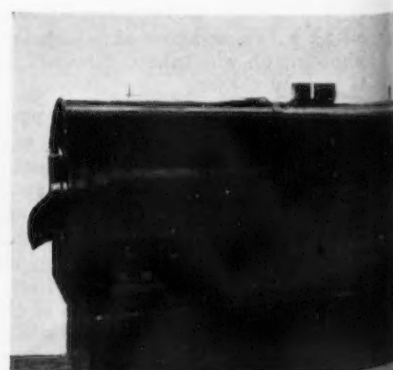
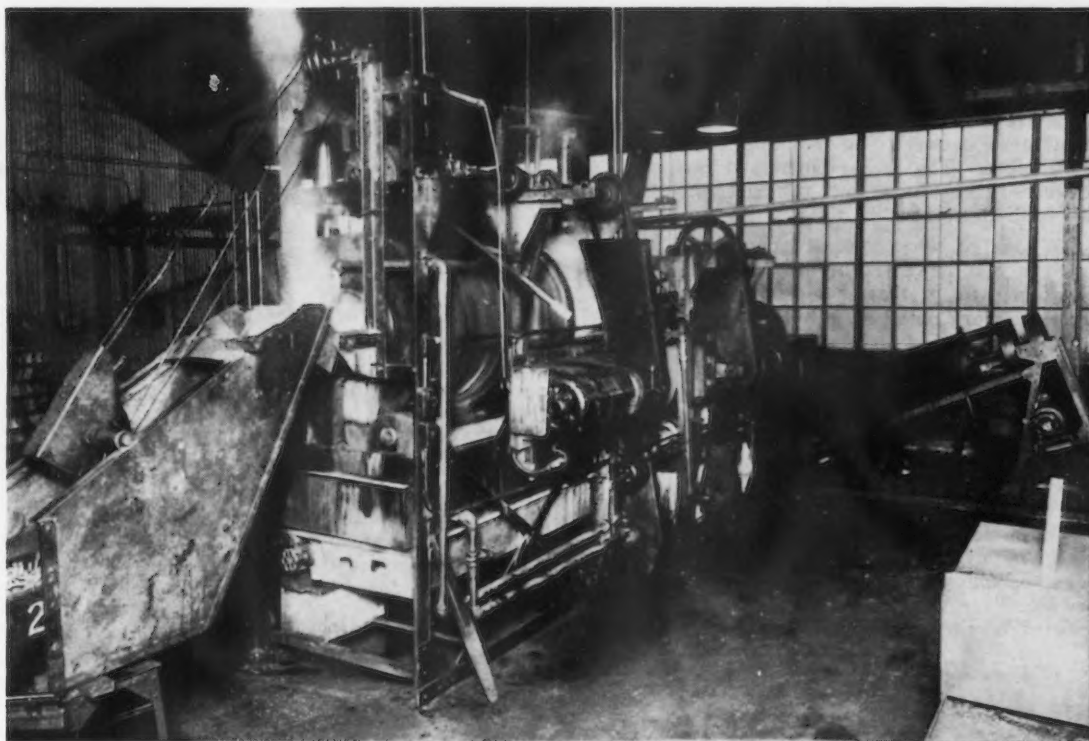


Fig. 5. This is a new type of automatic cleaning machine. The work is pumped over the work while tumbling is taking place and this discharges the work. It is claimed that labor is saved as against pickling.

Fig. 4. Auto kit tools are cleaned and anti-rusted in one operation. The former practice called for tumbling in cleaning solution for 1 hr. with 10 lb. of compound to 100 gal. After studying the nature of the dirt it was possible to devise a compound which cut the time in half and cut the amount of compound to 3 lb. per 100 gal.



centage of saponifiable oils, it is usually possible to clean with an inexpensive solution containing an alkaline soap. Pennies may be saved on cutting down or buffing compositions but this often adds dollars to subsequent cleaning operations.

The nature of the article to be cleaned is, of course, a necessary consideration. For instance, zinc and aluminum or their alloys are rapidly attacked by solutions of greater alkalinity than pH 10 while tin is spangled or even etched by solutions above pH 11. Brass tarnishes slowly in solutions up to pH 12, while above pH 12.5 it tarnishes heavily. Iron, if high in silicon, can be pitted above pH 13. Mineral oil pitches and waxes are best held in permanent emulsion at pH 8 to 9. In making up cutting oil emulsions and paste lubricants for drawing, this range should be kept in mind. But in removing these by cleaning, other factors enter.

Where the dirt consists chiefly of oil, a more alkaline cleaner works faster although it gives a less stable emulsion. And yet this very instability can be turned to advantage, for if allowed to stand idle, the solution will permit a large part of its suspended oil to separate making it possible to remove both the oil and the sediment and thus "regenerate" the solution as described previously in this series.

Many other factors are important in studying cleaning in relation to the nature of the article to be cleaned. Some of these are the fact that cast aluminum is more porous and sensitive to alkali than rolled aluminum, that lead brass is more sensitive to alkali than a brass containing no lead, that a flat piece may call for one solution whereas a threaded or knurled piece may require another.

#### Mechanical Economies

Having selected the cleaning process best suited to the work, the next consideration is the design of the equipment itself. Much has been done in recent years in the modernizing of cleaning equipment and the economies here fall under two headings, better cleaning and better handling.

Do not do by hand what can be done mechanically. This applies of course to production work where volume is being handled. There are very few cleaning operations today which cannot in some degree be handled mechanically.

Proper heating units and automatic thermo-regulators provide economies in steam or gas bills. Inadequate heating does not run up fuel bills but

it may be costly in slow cleaning, tied-up production, extra labor costs, and sometimes refinishing costs. Insulation, and in some cases tank covers to prevent steam loss, are worth while on large installations.

With steam heat it is a good idea to have both an open steam pipe and a closed steam coil in the cleaning tank. In the morning the solution can be quickly brought to the boiling point with the open steam line. The condensate so formed is sufficient to float off oil which has separated out overnight, over the overflow dam. The closed coil then suffices to maintain the solution at the boiling point.

With hot rinses the open steam pipe alone is needed, as a continual overflow is needed to keep the rinse surface clean.

Where running rinses, or spray rinses are used, water may be saved with a series of rinses on the counter-flow principle; that is, the rinse water in several compartments flows against the work travel.

Economy in the purchase of the cleaning materials may be achieved only by analysis of costs for the final result. Choice of cleaning compounds should be based upon over-all cost per unit cleaned and upon performance. Many large concerns today buy cleaning material on the basis of lowest cleaning cost figured from cost per pound multiplied by a rating factor which they have determined by actual production test on the material. Of the suppliers whose materials have been tested, the three best, say, (on the basis of unit price rating) are asked to bid on each purchase. This not only insures the best cleaning value but keeps the situation competitive.



barrel, rubber lined so that dilute acid can be placed. After cleaning, the drum automatically claimed that approximately 75 per cent of the and neutralizing in steel tanks.

**I**N the turning, drilling, sawing, threading and grinding of metals, the work done by the machine and the heat generated in performing this work are concentrated in a relatively small area between the tool and the work piece. The power consumed is converted into heat due to friction and to displacement of metal.

An idea of what actually happens may be had by referring to Fig. 1. The tool pries or tears the chip away from the work piece, rather than cuts, as evidenced by the wedge-shaped crack in the metal ahead of the edge of the tool. The sharp edge of the tool merely clears up and smooths the surface, while the heaviest work is done at some distance from the edge where the chip bears down on the tool and begins to curl, break up or crumble. Similar action takes place in grinding operations—there being as many “tool points” as there are abrasive grains in the stone at the area of contact with the work piece.

#### Functions of Cutting Oil

To reduce friction and to dissipate the generated heat, the use of a special lubricant and refrigerant in the form of cutting oil becomes necessary, particularly on rapid production work. The principal functions which a good cutting oil performs are as follows, in the order of their importance:

1—Lubricates all frictional points, reducing friction—the source of heat—and lowering the consumption of power.

2—Carries away and dissipates heat from the tool and adjacent parts and prevents the drawing of temper from the tool. It also distributes evenly the heat transmitted to the work piece throughout its extent, preventing distortion and contributing to accuracy of machined size.

3—Penetrates into the crack of the metal above the cutting edge of the tool, preventing the accumulation and packing of fine metal particles in this space which might cause the breaking off of the edge of the tool and gouging into the face of the work piece. A cutting oil having the lowest surface tension or possessing the best “wetting” properties performs this function best.

4—A good cutting oil acts as a flushing agent, washing away all metal particles.

5—It leaves a protective, rust-preventing coating on the work piece, the tool, and all adjacent machine parts.

6—The correct oil will also give added finish, which reduces time in grinding or other finishing operations.

When working with different metals on a variety of machining operations, various types of cutting oils are required in order to obtain the best

results from the standpoint of tool life, smoothness and accuracy of finish, considering also the further processing of the worked material.

Almost all of the common fluids, including air, water, milk, etc., have been tried out as a cutting medium with varying success, until practice in modern production work became standardized on compounded petroleum products, which form the basis of cutting oils.

#### Five Types of Cutting Oils

Cutting oils in common use may be classified as follows:

1—Straight mineral lubricating oils.

2—Mineral oils compounded with lard oil.

3—Sulphurized mineral oils.

4—Sulphurized mineral oil with lard oil.

5—Soluble or emulsifying oils.

Straight mineral lubricating oil such as ordinarily available in machine shops is still commonly used on odd milling, drilling, tapping and reaming jobs done slowly. The best that may be said in favor of straight oil is that it is better than no lubricant at all. On quantity production work it has been found that lubricating oil, regardless of price, is the most expensive cutting medium, viewed from the angle of tool life, quality of work, and cutting speed.

The frictional resistance and pressures involved in metal cutting are of such magnitude that ordinary lubricating oils will not stand up, as the oil film breaks down readily with the result that the tool is quickly dulled, obnoxious fumes are generated, and the work is erratic.

#### Field for Mineral Lard Oils

When mineral oil is compounded with animal oils, particularly inedible lard oil, greater “oiliness” results. By the term “oiliness” is meant here the improvement in performance as a cutting medium, whatever the reason may be. The addition of an animal oil to a neutral mineral oil changes its chemical properties, and, among other things, the affinity of the compounded oil to the metallic surfaces is increased, resulting in a more firmly-adhering and stronger oil film.

Until about 10 years ago mineral lard oils were considered the best cut-

# Types and Use of

By **MAURICE RESWICK**

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ting medium, but since, they have been displaced gradually by other forms of cutting oils, particularly those of the sulphurized types. The objection to lard oil compounds is their inherent susceptibility to becoming rancid, developing objectionable odors, and their low resistance to bacterial growth, which might lead to skin infection of the operators.

Mineral lard oils still have, however, a legitimate field of application. For example, in the manufacture of small size parts for clocks, watches and in instrument making, where precision and quantity of production are involved, mineral lard oils are preferred. When working brass and bronze, the use of sulphurized oils may result in discoloration and staining.

Mineral lard oil is available on the market in finished compounded form in several grades, depending on the viscosity of the base mineral oil and on the percentage of lard oil. The percentage of the latter may vary from 5 to 50 per cent.

Mineral lard oils of a light viscosity produce a transparent protective film on the work pieces which assists inspection. The close tolerances of the manufactured parts as well as the tight-fitting bearings of the machine

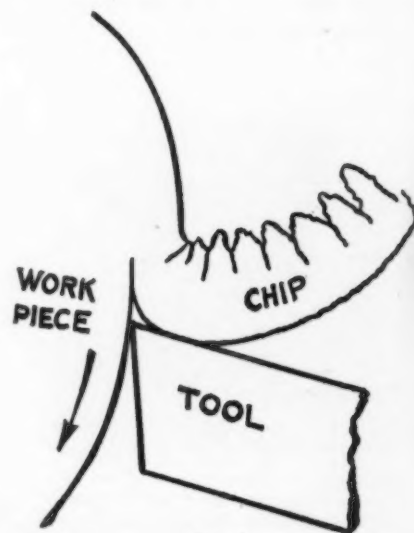


Fig. 1

# e of Cutting Oils ▲ ▲ ▲

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**I**N addition to outlining the functions of a good cutting oil, Mr. Reswick describes briefly the characteristics and uses of five commonly-employed varieties, including sulphurized and soluble or emulsifying oils. His discussion of the latter includes suggestions relating to the checking of strength, straining and filtering, and the prevention of skin infections.

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require a relatively light oil that is free from gumming, and that is rich in lubricating qualities.

In general, the smaller and the thinner the work piece is, the lighter should be the oil. The severity of the operation, however, must be taken into consideration, but experience is the only guide. An oil should be selected that will result in uninterrupted operation of the machinery with a minimum of shut-downs for tool changing and dressing.

## Sulphurized Cutting Oils Used in Rapid Production

The element which has the most pronounced effect in converting mineral oil into a successful and economical cutting oil is sulphur. By "sulphurizing" is meant the addition of sulphur to an oil in such a manner that it will enter into intimate combination with the oil and be evenly distributed.

There are two generally accepted explanations of the function of sulphur in a sulphurized cutting oil: (1) The sulphur particles act as a semi-solid lubricant and prevent metal-to-metal contact between the chip and the tool after the oil film is broken down under the tremendous pressure and intense localized heat. (2) The sulphur acts as an anti-flux, counteracting the tendency of the metal particles to become welded to the tool at the point of greatest pressure.

## Must Be a Stable Compound

Sulphurized cutting oils are most extensively used in the metal-working trades where rapid production combined with close tolerances prevails. It is the standard cutting oil on all work done on turrent lathes, cutting-off machines, pipe threading, etc.

The principal requirements of a

successful sulphurized cutting oil are as follows:

1—It must contain a pure grade of sulphur, incorporated in intimate chemical combination with a carefully selected oil, resulting in a stable compound that will not settle out nor separate under any condition, resisting even the violent centrifuging process in the reclamation of the oil from metal chips.

2—It must be free from objectionable odors without resorting to scenting materials or disinfectants, and must not turn rancid. Bacterial growth should be reduced to a minimum or eliminated entirely to make it an ideal cutting oil from the standpoint of safety and health.

3—It must not gum, become congealed, must be free from any pitting action, and must, in itself, be a satisfactory lubricant for metal cutting machine bearings.

4—It should produce a clean, smooth surface finish and prolong the life of the tool, thus contributing to quality and quantity of production.

5—Finally, it should be a finished product requiring no further treatment, and be carefully compounded to minimize objectionable smoking, frying and waste.

Sulphurized oils are available in several viscosities as a general rule. The heavier the service, the higher should be the viscosity, but consideration must be given to the fact that the lighter oils are more readily circulated and will carry away the heat faster.

The percentage of sulphur content in the oil is not a variable factor. Claims that one oil contains more sulphur than another are misleading. What really counts is the percentage of sulphur in intimate combination with the oil, in addition to the natural sulphur which is already present in the base oil. A given oil can hold only a definite amount of added sulphur, and any excess usually settles out in storage and is of no benefit—in fact, free sulphur that has settled out is decidedly objectionable. The usual quantity of added sulphur is under 3 per cent.

The combination of sulphurized mineral oil with lard oil possesses the advantages of both the sulphurized mineral oil and the increased film strength imparted by the animal oil.

The function of the animal oil is to increase the lubricating qualities of the cutting compound.

Sulphurized mineral lard oils are used in working alloy steels, in deep hole drilling, heavy reaming, broaching, gear cutting, and machining of tough high-carbon and alloy steels in general. The additional lubricating qualities due to the lard oil are of particular benefit where considerable direct friction between the tool and the work piece is involved, such as in broaching and reaming.

The percentage of lard oil to sulphurized mineral oil is a matter of determination under actual operating conditions. In general, it is desirable to use a cutting oil with the lowest percentage of lard oil that will do the work, as too great a percentage of animal oils not only increases the cost but also tends to an increase of rancidity, disagreeable odor and unsanitary conditions with continued use.

## Characteristics of Successful Soluble Oil

Soluble or emulsifying cutting oils consist of specially-treated oils that possess the property of entering into solution with water at prevailing temperatures, producing a milky colored emulsion. The resulting mixture acts as a lubricant by virtue of its oil content and as a coolant for the reason that water is the best refrigerant known, having the highest coefficient of heat conductivity and the greatest thermal capacity of any liquid. In other words, what the water lacks in "oiliness" is made up by the treated oil, and what the oil lacks in cooling properties is made up by the water.

The performance characteristics of a successful soluble oil are as follows:

1—It must mix readily with all kinds of water at faucet temperature and in all proportions required for production work.

2—The emulsion or solution must be stable under all conditions, and there should be no separation or settling out.

3—The oil should form an even film over the surface of the work piece, and this film should serve as a rust preventive.

4—It must be readily washed off the work piece preparatory to further processing, such as painting, lacquering, enameling, and the like.

5—The oil should be chemically inactive, have no objectionable odor, not become rancid, nor foam, and resist the development of bacteria which may be injurious to the skin of the workmen.

6—It must not become gummy, clog up pipes, fill up taps or dies, nor congeal at low temperatures.

7—In grinding operations the metal and wheel grindings must be readily separated out of the solution.

The field of application of soluble cutting oils in the metal working industry includes quantity production of malleable iron fittings, automotive and airplane parts, the grinding of ball and roller bearings, and machining operations in general.

The proportions in which soluble oil is mixed with water for representative machine operations, as a general guide based on experience, are as follows:

Operation	Parts Water	Parts Oil
Turning and boring...	20 to 35	1
Threading .....	10 to 20	1
Drilling .....	20 to 50	1
Cold sawing .....	10 to 35	1
Screw cutting .....	15 to 25	1
Automatic machinery ..	15 to 25	1
Broaching .....	5 to 20	1
Gear hobbing .....	5 to 20	1

There is usually an optimum point in the ratio of soluble oil to water which gives the most efficient performance, and this ideal ratio can be determined only by repeated experiments, using the recommendations given above as a starting point. It should be remembered that soluble cutting oil must always be used with water, and never in its original form. In any event, a mixture richer than about one-third oil and two-thirds water should not be considered.

#### Strength Checking, Straining and Other Soluble Oil Problems

The percentage of water in the soluble oil emulsion should be checked occasionally, as water is gradually lost by evaporation. This is usually done by breaking up, with concentrated hydrochloric or sulphuric acids, a sample of the emulsion which has been measured out in a graduated cylinder. The amount of separated oil is used as the basis for calculating the amount of water to be added to make up for evaporation losses. Only in rare cases should it be necessary to make further additions of soluble oil.

In metal cutting operations trouble is frequently experienced if the small metallic particles are permitted to drain into the tank containing the solution. It is advisable to filter or strain all oil leaving the machine, and to arrange the inlet near the bottom of the tank, so that the solution will not become agitated. At frequent intervals the accumulation of the settled out dust and iron shavings should be removed, as they have a tendency to impair the quality of the solution.

#### Copious Flow at Low Pressure Most Effective

In grinding work it is recommended that the soluble oil solution be filtered through burlap, long cloth or muslin bags as it leaves the machine, in order to remove as much of the wheel grindings and metal particles as possible before the solution is returned to the storage tank. Mechanical fil-

ters are also available commercially for this purpose.

To utilize to best advantage the inherent cooling and lubricating properties of soluble oils, the flow of the solution should be directed on the work piece and cutting tool in copious quantities at low pressure. A stream of cutting oil solution at low pressure through a  $\frac{3}{4}$  in. pipe is more effective than if the same quantity per minute were delivered through a  $\frac{3}{4}$  in. pipe at high pressure. When the stream is under considerable force, there is a tendency to miss the critical point of application and to splash the solution over the entire machine, while a steady stream at a lesser pressure absorbs more heat per unit volume and maintains the work piece at a more uniform temperature, which results in more accurate work and longer tool life.

The lubricating oil used on the machine bearings often finds its way into the cutting solution and rises to the top of the tank, giving a false indication of possible disintegration of the soluble oil. This should be disregarded as it does not impair the efficiency of the emulsion.

Sometimes, though infrequently, soluble oil emulsions will foam excessively. This is usually the result of excessive agitation in a soluble oil storage system of inadequate capacity. Increasing the storage capacity is the practical remedy, and this should be done before finding fault with the oil used.

#### Preventing Skin Infection

All cutting oils carry minute particles of metal which cause skin abrasion on the arms and hands of the workmen. When the cutting oil is permitted to become contaminated with impurities, such as food refuse, expectorated matter, as a result of slovenly habits and indifference to sanitation, the soluble oil mixture may become a culture and carrier of bacteria. If the workmen is susceptible to skin-diseases, infection, in the form of a rash, pimples, boils, etc., will set in.

It is well known that even when using the best toilet soaps, if the soap is not completely washed off, the skin on the hands might become irritated, chapped and develop a rash. These skin irritations are technically known as "alkali burns." The effect of cutting oils on the skin is similar, and the remedy is obvious: to expose the hands and other parts of the body as little as possible to direct contact with soluble oil, and not to permit the oil to dry out on the skin, but to wash it off frequently.

There is only one sure way of preventing skin infections, and that is careful attention to sanitation. The addition of antiseptic materials has proved to be for the most part ineffective. Next to keeping the emulsified mixture in as clean a condition as pos-

sible, the personal hygiene of the workman is of first importance. Washing of hands several times a day, a change of underwear twice a week, frequent washing of overalls, and the use of mildly antiseptic hand soap, will eliminate skin diseases entirely. Wherever cutting oils of any kind—sulphurized, lard, or soluble—are used, the importance of cleanliness should be stressed.

Soluble oil as it leaves the manufacturing plant is, as a rule, free from any matter that may lead to the growth of injurious bacteria, but it is sometimes put into dirty tanks at the shop in which bacteria culture has already had a favorable start for growth and multiplication. To combat the growth of fungi and bacteria, which may prove injurious to the workmen when they come in contact with open wounds, the solution should be periodically inspected, noting any obnoxious odor, fermentation, rancidity, discoloration and the general appearance of the solution. If it appears to be contaminated, it is necessary to discard the entire batch, clean the tank and all pipe lines with either an alkali such as sal-soda, hot water or steam, and refill the system with a fresh solution of soluble oil and water. A slight disagreeable odor of the solution is not alarming, as it usually disappears when the solution is agitated by circulation.

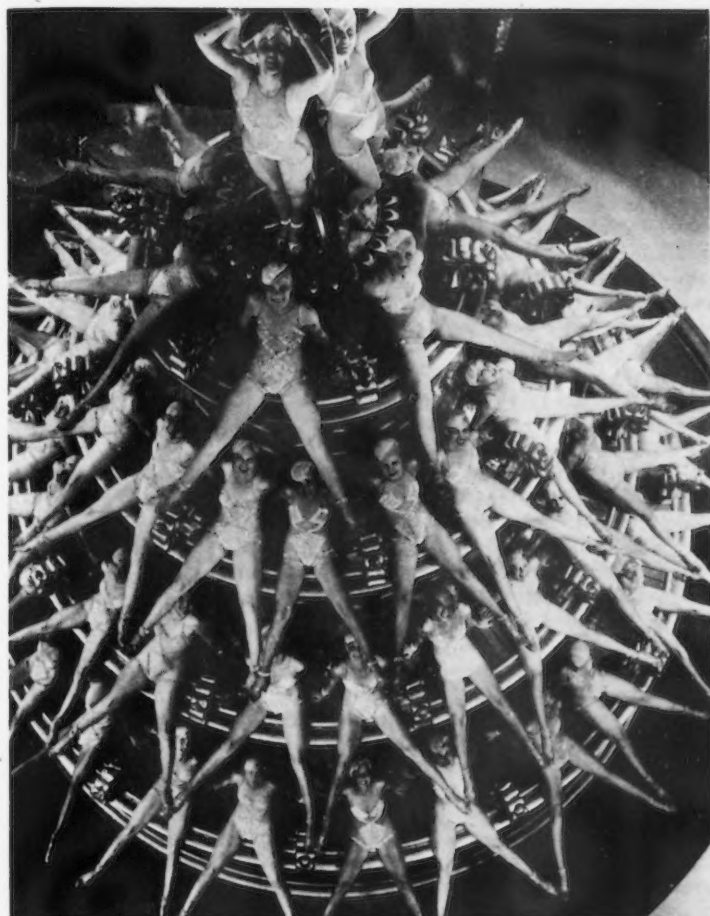
#### Soluble Oils for Rust Preventive and Other Uses

As a final dip for pickled sheets, pipes, and castings, a solution of soluble oil is satisfactory, as it provides the material with a rust preventive coating which is readily removed before painting, enameling, or galvanizing. It is necessary, however, to thoroughly wash all acids from the sheets before dipping in the emulsion.

In light stamping and press drawing operations soluble oil is frequently used as a lubricant on the dies and tools. It is also used in metal working in general where it is advantageous to utilize its inherent properties as regards high heat capacity, high heat conductivity, rust prevention, lubrication and the ease with which the thin coating of emulsified solution can be removed.

As a fluid medium in hydraulically-operated cylinders on elevators, in mills, and machinery in general, soluble oil in water solution is in successful use. On such applications it has the advantage of economy, preservation of plungers and operating mechanism against rust, and any leakage is readily detected by the milky color of the solution. Soluble oil is also used in checking leaks in valves as a final inspection.

The author wishes to acknowledge his indebtedness to Messrs. H. F. Lefurgy and H. W. Jones, of the Pennsylvania Lubricating Co., for their collaboration in the preparation of this article.

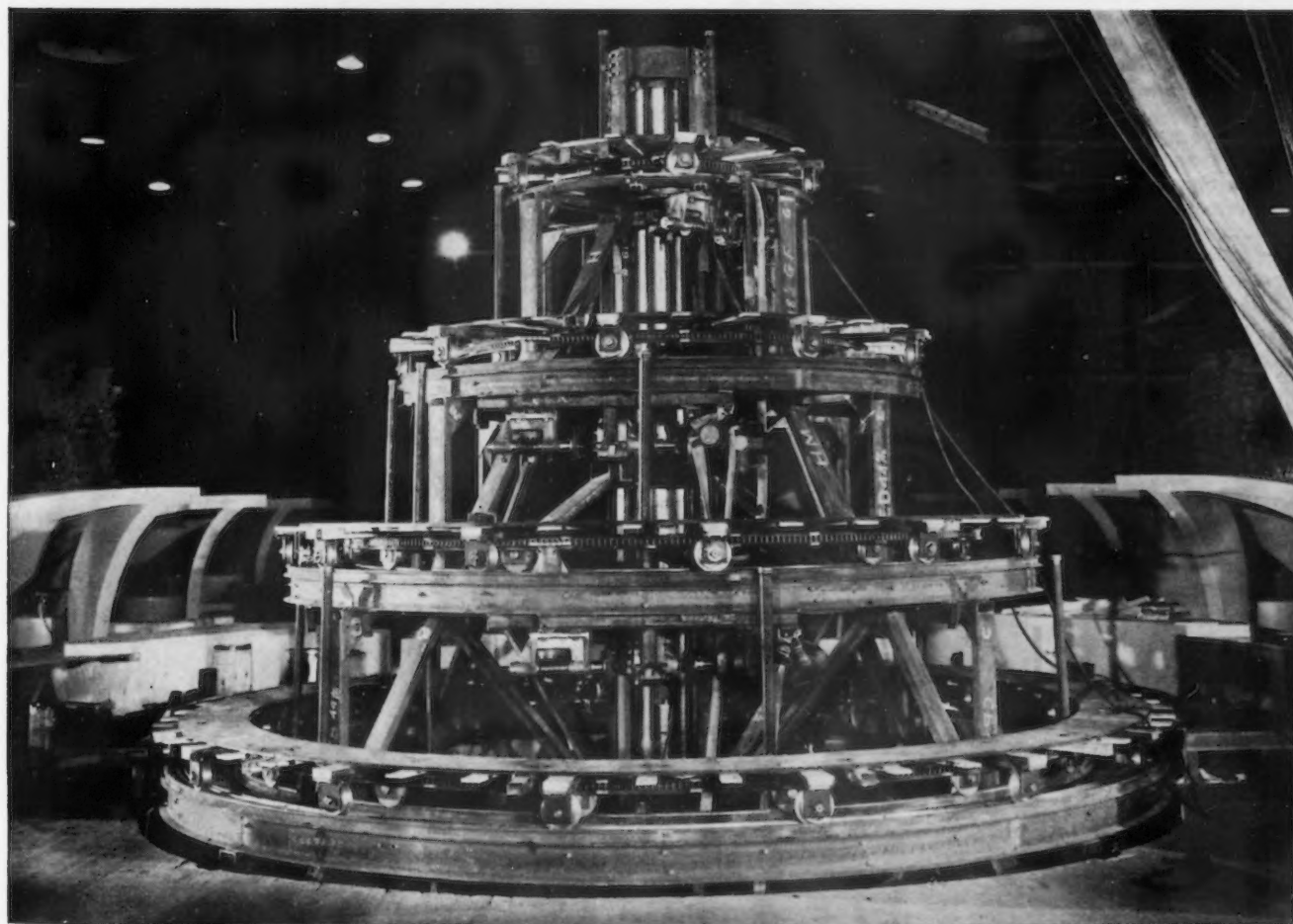


## Steel Goes Hollywood

SINCE Warner Brothers, of Burbank, Cal., started the ball rolling with their gigantic multiple-platform tower, which folds or extends silently despite the almost six tons of metal on it, other studios either are planning or contemplating equipment of a distinctive nature for their own productions.

Varied numbers of good-looking Hollywood Ganymedes, Astartes, Hebes and Dianas are destined to disport their charms with all the human motion for which Hollywood is famous, plus the product of the machine.

This device employs a permanent shaft sunk below the sound stage and cemented, prior to putting on the fountain superstructure. The hydraulic shaft or lift is more than 20 feet in length and is used to operate the rotating platforms of the fountain. This jack had to be turned on the biggest lathe on the West Coast. Water pressure of 250 pounds furnishes the motive power.



## Introduces New Line of Continuous Surface Broaching Machines

THE Foote-Burt Co., Cleveland, has brought out the new type surface broaching machine here illustrated which offers particular advantages where very high production is required. This type machine lends itself to use of unusually long broaches with many teeth, which makes possible almost any desired quality of finish. Each tooth throughout the length of the broach has a predetermined amount of rise. The first teeth, or roughers, remove the major portion of the metal, and those that follow do the finishing. As no tooth is ever burdened with excessive cuts, long tool life is obtained. Slow cutting speeds also contribute to economical tool life. The broach of the connecting rod cap broaching machine illustrated, for example, operates at a cutting speed of only 25 ft. per min., and will average about 50,000 cuts per grind.

The machines are available in three sizes designated as the Nos. 5, 10 and 15, with capacity of 5, 10 and 20 hp. respectively, and with maximum broach length of 30, 60 and 75 in. respectively.

Development of the company's vertical type equipment, introduced about seven years ago, showed that surface broaching operations require a very rigid and heavy machine, and the new type units have been designed accordingly. The bed is of box type, heavily ribbed, and is cast in one piece. The motor, coupled directly to the work shaft, transmits power to the driving sprocket through a worm and worm gear and a helical gear reduction, which provides the smooth drive to the chain required for broaching operations. Gears and other moving parts are lubricated by oil carried in the drive housing.

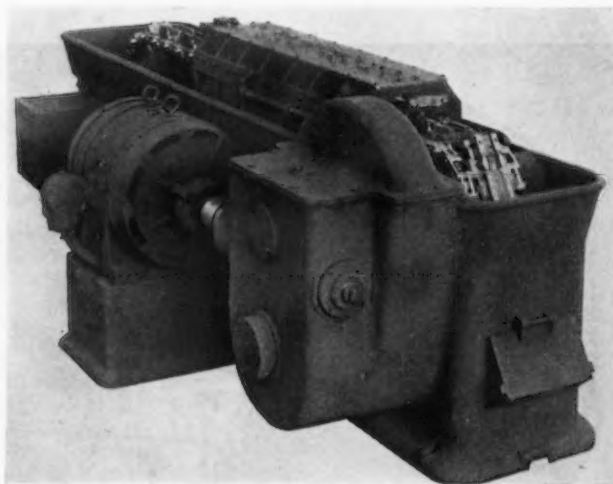
The chain wraps around the driving sprocket and idler sprocket and is very accurately constructed, as the work-holding fixtures are assembled directly to the chain. The fixtures

are always placed equidistant about the chain for convenience in loading; the number of them varies with the production desired and the size of the work. The chain is used merely to pull the fixtures through the fixture tunnel.

This fixture tunnel is mounted on the top of the bed of the machine and has tool-steel guides where the fixtures ride. The rigid support of the fixture with the broach holder in position makes the tunnel virtually a solid structure, and it is stated that this construction binds in all bursting strains, assuring both accuracy and long broach life. The broach holder is made with adjustable wedges to facilitate setting the broaches to the cut, and also to compensate for the amount of metal removed when the broaches are reground. Fixtures usually are of automatic clamping type. The operator merely drops the work into them, a cam guide serving to position the work properly at the point where the fixture is automatically locked by means of built-up pressure from a trip hammer blow. After the fixtures pass through the

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About 3/16 in. of metal is removed from the two joint faces and the two outer end-surfaces of connecting rod caps. Production is at the rate of 1800 pieces an hour. The operator merely loads the fixtures on the fixture-carrying chain; after being machined the work is unclamped automatically and discharged into the chute at the end.



broach cut, they are released automatically by a cam at the unloading position, and work falls into chute.

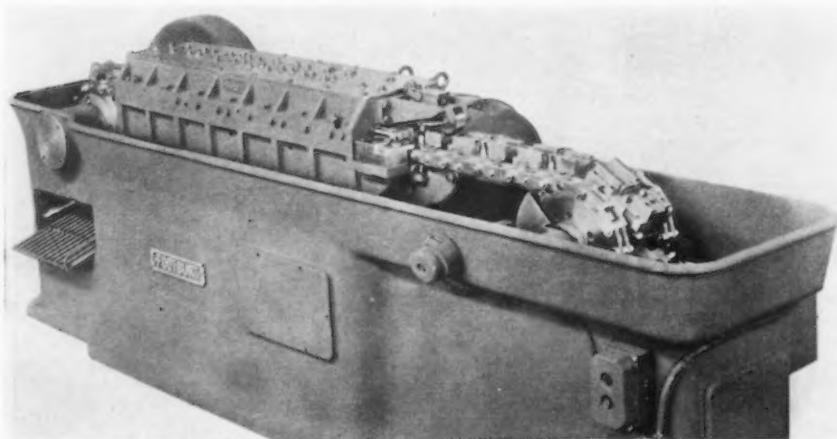
One illustration shows the front and the operator's or loading end of the machine. The fixture exposed is for holding a connecting rod cap, which is placed so that it will rest on the two steel buttons which contact the two back bolt bosses. It is of vise type, the jaw on the drive side being the solid part and acting as a heavy anvil support to the work, while the other jaw is movable and is actuated by a wedge with a fast angle followed by a slow angle for securely locking the cap sidewise. The broach employed is made up of a number of sections which are easily removed for regrinding.

The connecting rod cap is a tough forging and about 3/16 in. of metal is removed from the two joint faces and the two outer end-surfaces. The finish is smooth and the production is 1800 pieces an hour.

In addition to a push-button station for starting and stopping, the machines are provided with a special plugging switch to permit instant stopping of the machine should the occasion demand. Coupled with these is an automatic plugging switch, located in front of the broach so that should the operator be careless in placing the work in the fixtures, the uneven position of the work will

cause it to strike the guard, which will plug the motor and immediately stop the machine.

An abundant supply of coolant is pumped through jets throughout the entire length of the broach holder, so that the work and tools are properly lubricated and kept cool. At the same time the chips are washed from the teeth of the broach down through cored openings into the lower portion of the bed, which forms the coolant tank, from which they may be raked out at intervals through a door at the end of the machine. On the larger units a chip conveyor is provided for draining and carrying the chips out of the machine.



## Three-Wheel Grinder for Tools of All Materials

FOR economical maintenance of accurate and keen cutting edges of high-speed steel and carbide tools, the Sundstrand Machine Tool Co., Rockford, Ill., is offering the three-wheel tool grinder here pictured. The machine is available in any of three speed combinations. In one, the speed of one spindle is suitable for grinding high-speed steel and stellite tools, and the speed of the second for cemented carbides. The third spindle in this, and also the other two speed combinations, is equipped with an 8-in. diamond-dust-impregnated cast-iron disk for honing. In the second speed combination, the speed of both grinding spindles is suitable for tungsten carbides, one spindle carrying a roughing wheel and the other a finishing wheel. In the third speed arrangement two spindles have speeds suitable for grinding high-speed steel and stellite, one carrying a roughing wheel and the other a finishing wheel. All spindles are reversible, so that both right- and left-hand tools can be ground.

The heavy pedestal of the machine houses the 3-hp. driving motor, vee belt drive and coolant pump, all of which are accessible through the pressed steel cover. Honing and grinding carriages are supported by 3-in. diameter, solid steel bars. The honing table is graduated to permit accurate adjustments through 40 deg. Handles are provided on opposite ends of each carriage for traversing of tools across the face of cup wheels. Grinding tables are adjustable 10 deg. above to 30 deg. below horizontal, and there is an indicator to show the exact

setting. The side carriages have micrometer feed-in arrangement.

Two 10-in. cup wheels are standard equipment. Wheel spindles are of chrome-nickel steel, heat treated, and run in sealed ball bearings. Coolant nozzles, as well as the electric light fixture, are adjustable either side of the wheels. A 6-gal. capacity coolant tank is supported at the rear of the pedestal.

## Pyrometer for Taking Roll Temperatures

FOR determining surface temperatures of revolving rolls, cylinders and dryers, the Illinois Testing Laboratories, Inc., 141 West Austin Avenue, Chicago, is offering a new roll-type pyrometer.

This pyrometer is entirely self-

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(At right) The supporting arm of this roll-type pyrometer carries both the indicator and the ribbon thermocouple. It can be of any length up to 48 in.

(Below) This three-wheel tool grinder is available in any of three combinations, the third spindle of all of which carries a diamond dust impregnated disk for honing.

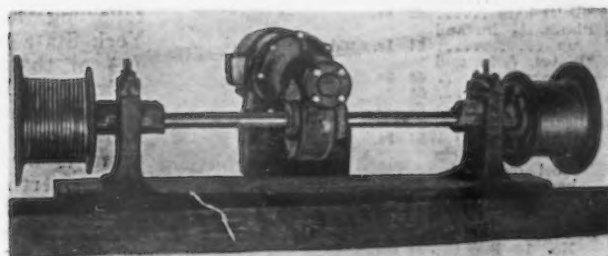


contained. The indicator is mounted in a supporting arm that also holds the thermocouple. The latter consists of a ribbon or a flat strip-type wire which is placed directly in contact with the revolving roll. It is held in a bow-shaped assembly that provides suitable tension to enable the thermocouple to be used on revolving rolls regardless of roll diameter. A grooved carbon block permits pressing the thermocouple only so far against the roll. The thermocouple assembly can be adjusted to almost any desired position in relation to the indicator. It is connected to the instrument by means of extension wires on the inside of the supporting arm. The latter can be of any length up to 48 in. The indicator consists of a rugged millivoltmeter having a case diameter of 4½ in. The scale is 3½ in. long, and can be furnished with graduations of either 0-600, 0-800 or 0-1000 deg. F. The instrument can be furnished with an internal automatic cold end compensator for atmospheric or room temperature variations.

## Twin-Hook Electric Hoist

A TWIN-HOOK electric hoist for lifting long and bulky loads, furnace doors, sections of monorail track, and for all hoisting that requires handling of loads from two points, has been added to the line of Electro Lift, Inc., 30 Church Street, New York. This hoist may be rigidly suspended, as illustrated, or carried from a trolley running on monorail track. It is built in capacities of from 500 to 6000 lb. The two drums, operating together, are mounted on an extended drum shaft which may be of any length to permit spacing of hooks to meet individual requirements.

Features include single worm, noiseless drive and use of anti-friction bearings throughout. All parts are enclosed, and gears and bearings operate in a bath of grease. The electric motor brake and limit switch provide an automatic positive stop to prevent overtravel of the hook at the top of the lift. Either rope control or automatic push-button control can be furnished.



Twin-hook electric hoists for long and bulky loads. It may be rigidly suspended or carried from a trolley on a monorail track, and the drumshaft may be of any length.



## THE NEWS OF THIS WEEK

### British Pig Iron Demand Slackens— Steel Orders Increase on Continent

**L**ONDON, ENGLAND, Dec. 5 (*By Cable*).—Pig iron is quieter. Home consumers are temporarily satisfied and makers are disinclined to seek forward business. Export orders are scarce, but prices are firm.

Keen demand for semi-finished steel has developed, while more rail, bridge and structural orders have been released. More steelworks are resuming production after several years' idleness.

#### British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export .....	£9		
Billets, open-hrth. £5 10s.		to	£5 12s. 6d.
Black sheets, Japanese specifications .....	£11		
Tin plate, per base box .....	16s. 6d.	to	17s.
Steel bars, open-hearth .....	£7 17½s.	to	£8 7½s.
Beams, open-hrth. £7 7½s.		to	£7 17½s.
Channels, open-hearth .....	£7 12½s.	to	£8 2½s.
Angles, open-hearth .....	£7 7½s.	to	£7 17½s.
Black sheets, No. 24 gage .....	£9 5s.		
Galvanized sheets, No. 24 gage....	£11 5s.	to	£11 15s.

#### Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86			
*Ingots .....	£2 5s.		
*Billets, Thomas..	£2 7s.		
Wire rods, No. 5 B.W.G. ....	£4 10s.		
Black sheets, No. 31 gage, Japanese .....	£11 5s.		
*Steel bars, merchant .....	£3 2s. 6d.		
*Sheet bars .....	£2 8s.		
Plates, ¼ in. and up .....	£4 1s. 6d.		
*Plates, ⅞ in. and 5 mm. ....	£4 3s. 6d.		
*Sheets, ½ in. ....	£4 8s. 6d.		
*Ship plates .....	£4 10s.		
*Beams, Thomas..	£2 19s.		
*Angles (basis) ..	£3 2s. 6d.		
Hoops and strip steel over 6-in. base .....	£3 17s. 6d.		
Wire, plain, No. 8	£5 7s. 6d.		
Wire nails .....	£5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G..	£8 15s.		

\*Prices as established by European Raw Steel Cartel.

Tin plate is easier on quiet demand, and fear of United States competition is growing. Welsh makers' work on hand now totals 2,500,000 boxes, and some are fairly well placed to the end of the year. Welsh tin plate interests plan to erect tinning pots only at Sarnia, Ont., in conjunction with Dominion Alloy Steel Corp'n. to tin Welsh black plate.

The Continental steel market is holding a healthier tone, following Clabecqs decision to adhere to Belgian Cartel. Russia has placed 5000 tons of sections and 6000 tons of plates. The section order passed to France and the plates to Clabecq. International Raw Steel Cartel reports bookings for Nov. 1 to 25 of 120,000 tons, against 72,000 tons in the previous month.

Swedish gas and boiler tube makers have joined the International Tube Cartel.

The Italian Monfalcone shipyards are building two 18,000-ton liners for the Gdyniamerica Line.

### Code Adherence Part of New York Law

**C**ODE authorities acting under permanent codes have been advised by James F. Hodgson, regional compliance director for the NRA at New York, not to lose sight of the advantages which they may obtain by following the provisions of the New York State law known as Chapter 7 (a) of the laws of 1933. This so-called Schackno Bill adopts the codes of fair competition as the law of New York State, provided, however, that there is filed with the Secretary of State a certified copy of the code. Such a copy may be obtained from the NRA at Washington, and upon its filing with the Secretary of State of New York it becomes effective as governing intrastate transactions in New York. Any violation of code

provisions will thereafter be punishable as a misdemeanor in New York State, carrying as a punishment a fine of not more than \$500 for each offense, and for each day such violation continues a separate offense subject to the \$500 fine shall be deemed to have been committed.

The New York statute is especially pertinent because, under it, if the code gives the power to the Code Authority, or any other group, to subpoena witnesses, to compel the production of books, papers and records, etc., a like power is vested with regard to intrastate transactions. Furthermore, the Supreme Court of New York State is given jurisdiction to prevent and restrain violations of any code of fair competition filed pursuant to the act and to prevent and restrain "the commission within this State of any act tending to defeat or hamper the operation and effectiveness within the State" of the National Industrial Recovery Act, not only at the instance of the code authority but "at the instance of any party whose interests are, or may be, adversely affected by such violations or acts."

### Grave Marker Demand Helps Foundry Business

**A**RTISTIC grave markers in cast bronze has become an important specialty product of many non-ferrous foundries during the past year. The demand has done much to fill the gap caused by lack of orders for ornamental bronze castings in the building and allied fields.

The markers are made in various sizes from 6 to 13 in. wide, 12 to 24 in. long, and about 3/16 in. thick. The lettering and simple symbolic floral designs are in raised letters, and corrugated pins are cast to the under side to hold the marker firmly in a concrete foundation. The composition is generally 85 per cent copper and 5 per cent each of tin, lead and zinc.

When used along the coast where the atmosphere has a high salt content, the lead component is reduced to 1½ per cent and the proportions of tin and zinc are raised to 6.75 per cent each.

# Steel Founders Organize to Put New Code Provisions Into Effect

**F**OLLOWING the approval of the code of fair competition for the steel casting industry by the President on Nov. 2, a general meeting of the entire industry was called for Hotel Sinton, Cincinnati, Nov. 27 and 28, by T. H. Harvey, president of the Steel Founders' Society of America, to put into effect the active provisions embodied in the code. More than 100 firms producing 85 per cent of the tonnage of the country were represented at the meeting by their executive officers.

A chronological narrative of the code negotiations was given by President Harvey and Col. Merrill G. Baker, executive vice-president of the society. F. A. Lorenz, Jr., American Steel Foundries, Chicago, then presented in detail each article and section of the code as approved and in effect Nov. 13.

## One Hundred Per Cent Adherence to Wage Rate Increases

In reviewing the labor provisions a roll call showed 100 per cent adherence to the wage rate structure established by the industry. This has resulted in raising not only the minimum pay for common labor provided in the code, but also has effected a general increase of 10 to 30 per cent in all classes of labor throughout the industry.

The administration of the code is under direction of the board of directors of the Steel Founders' Society composed of district representatives from the eight geographical divisions of the country as follows: Clarence Tolan, Jr., Dodge Steel Co., Philadelphia; Keith Williams, Pratt & Letchworth Co., Buffalo; W. J. Glover, Glover Machine Co. Works, Marietta, Ga.; D. C. Bakewell, Duquesne Steel Foundry division, Continental Roll & Steel Foundry Co., Pittsburgh; E. L. Brooks, Sawbrook Steel Castings Co., Cincinnati; F. A. Lorenz, Jr., American Steel Foundries, Chicago; A. O. Woerner, Scullin Steel Co., St. Louis; R. E. Noack, Monarch Foundry & Engineering Corp., Ltd., Stockton, Cal. In addition to the board the executive officers are T. H. Harvey, president; Colonel Merrill G. Baker, executive vice-president; and R. L. Collier, secretary.

## Adjustment of Labor Complaints

A detailed plan for the fair adjudication of complaints within the industry was discussed and approved. Labor complaints will be referred for investigation to a joint committee composed of an equal number of employees and employers with an impartial chairman designated specifically to serve upon each complaint as it is presented. To provide personnel

for these committees, a panel of one working employee chosen by the men and an alternate and one employer and an alternate from each plant will be provided in the offices of the society. Similarly, complaints between members of the industry will be investigated by an impartial committee composed of employers designated from such a panel.

Interpretation was given to various provisions of the code. Notably, the fair practice section defining terms as net 30 days was interpreted to mean 30 days after the month in which the castings are shipped, while the 1/2 per cent discount available to customers within ten days of shipment covers payment by mail postmarked within the 10-day period, invoices to bear the date of shipment.

## Open Price Provision

The steel foundry industry has available in its code an open price provision which was discussed in detail. The sections carrying this provision are as follows:

Article VII. Sec. 2.—If the agency of any subdivision or product classification, formed in accordance with the provisions of Section 1 of this article, so decides, each member of the industry manufacturing products falling within such subdivision or product classification shall, within ten days after notice of such determination, file with the agency a price list prepared by such member of the industry, showing its current prices and the agency shall immediately send copies thereof to all members of the industry engaged in the manufacture of such specified product. Revised price lists may be filed from time to time thereafter with the agency by any such member of the industry to become effective upon the date specified therein, but such revised price list shall be filed with the agency at least ten days in advance of the effective date, unless the agency shall authorize a shorter period. Copies of such revised price lists with notice of the effective date specified shall be immediately sent to all members of the industry manufacturing such product, who thereupon may file, if they so desire, revisions of their price lists specifying the effective date, which shall be on or after the date when the revised price list first filed shall go into effect.

Sec. 3.—If the agency of any subdivision or product classification so decides, no member of the industry within such subdivision or product classification shall sell directly or indirectly by any means whatsoever any product of the industry included within a subdivision or product classification for which the agency shall have given notice requiring the filing of price lists, at a price less than the price shown for such product in the list filed by such member.

## Investigation of Fair Price Levels

A scientific investigation to determine fair price levels to both consumer and producer has been undertaken by the society. Assuming 1926

as constituting a normal business year in the industry, a study has been prepared and a base schedule on a weight quantity basis with discounts reflecting prices of various steel casting commodities in that period has been made available to Ford, Bacon & Davis, an impartial engineering firm, for study. This firm is checking the base schedule in various localities throughout the country and when revised and approved it will form a basis for the cost and statistical division to determine a true base level. An analysis of factors influencing costs of steel castings will provide a sliding scale index whereby cost levels of steel castings under varying conditions may be referred to this standard or normal when determined.

Study showed that many of the items affecting cost were subject to almost identical market influences, so that for all practical purposes they could be grouped together and their fluctuations measured by a common factor. Thus, the market prices of almost all purchased metals were found to either follow the steel scrap market or the pig iron market. Scrap and pig, therefore, had to be accorded a place in any index developed. All other purchased materials from molding sand to chaplet nails were considered to vary in price as the combined cost of labor, scrap and pig iron varies as compared to the normal cost of these items.

It was found that normally the cost of labor represented approximately 50 per cent of the total cost of producing steel castings, varying from about 40 to 60 per cent in some cases. The materials that vary in price according to the market price of pig iron were observed to be normally about 7 per cent of the total production cost. Likewise, those cost items (principally metals) that fluctuate in price in accordance with steel scrap quotations were found to constitute about 14 per cent of the total cost.

Other purchased materials and variable cost items that fluctuate roughly in accordance with the combined market levels for all three of the preceding elements were also considered to be normally about 14 per cent, leaving 15 per cent to cover fixed charges. After much study, the following index was finally established:

Index	Normal
Element	Weight in Index
Labor .....	50.0
Pig iron .....	7.0
Scrap .....	14.0
All other variables....	14.0
All other—fixed.....	15.0
Total .....	100.0—normal

The dollar equivalent of each of the elements in this index was determined as existing in 1926, using records of the society and published price summaries as quoted in THE IRON AGE. The item "all other variables" in this dollar translation is given the combined weight of labor,

pig iron and scrap, while the fixed charges maintain the constant weight. The accuracy of the index in revealing charges has been checked against a number of statistical series and found to be correct within less than 1 per cent. The current position of the index in relation to 1926 is 85.5. By use of the index it will be possible to measure cost fluctuations and make adjustments commensurate with current conditions at recognized periods.

#### Open Price Plan to Be Adopted Shortly

The application of the open price plan is contemplated in the near future. This will involve filing with the offices of the society by each member, current prices on the various classes of steel castings sold by each member. These will be reported to the industry and change in prices may be made upon filing substitute lists and after a 10-day period. This constitutes a measure of price control, but without any element of agreement or price fixing.

At the closing session Clarence Tolan presented a resolution unanimously adopted affirming the belief of the industry that operation under the NIRA will be of pronounced value in its progress toward a return to normal, satisfactory and profitable operation.

### Battelle Institute to Study Watch Metallurgy

THE Battelle Memorial Institute, Columbus, Ohio, has established a research project for the study of the metallurgy of watchmaking sponsored by the Elgin National Watch Co.

The variety of alloys used in watch parts has remained the same for many years, and the metallurgical advances that other industries have developed and applied to their products have been singularly lacking in the horological industry. To overcome this inertia and to improve and standardize metal watch parts are the primary objectives of the new project.

### Production Statistics Cover Electric Weld Pipe

PRODUCTION figures for electrically welded pipe and tubes and for products rolled from old rails have been added to the statistics published annually by the American Iron and Steel Institute. The record for 1932, which has just been published, contains the amount of seamless tubes that were cold drawn, the tonnage of tubular goods, both of iron and steel, that was electrically welded, and also separate totals of production of seam-

less, lap weld and electric weld pipe and tubes finished with galvanizing or enameled or made of stainless steel. For example, output of stainless steel seamless tubes was 974 tons last year and there was in addition 25 tons of stainless electric weld pipe. Production of enameled pipe amounted to 11,282 tons in lap weld form and 62,749 tons in electric weld material.

Of the 1932 production of 10,451,088 tons of rolled iron and steel, 196,286 tons came from old rails, as follows: Concrete bars, 110,490 tons; light structural shapes, 41,879 tons; merchant bars, 24,265 tons; rails, 9488 tons; steel strip, 2582 tons; cross ties, 1453 tons; long angle splice bars and tie plate bars, 1268 tons; miscellaneous products, 4861 tons.

### Fabricated Steel Bookings Increase

OCTOBER bookings of fabricated structural steel were smaller, but shipments were larger, according to the American Institute of Steel Construction, Inc. Despite the resulting reduction of backlog, the volume of orders for future fabrication on Nov. 1 was much larger than the average monthly backlog during the first half of this year, and somewhat better than in the corresponding period in 1932. October bookings aggregated 53,500 tons for 183 reporting companies, and shipments were 72,900 tons. On Nov. 1 about 312,300 tons on hand for future fabrication was reported by 86 per cent of the industry.

### October Coke Output Declined 9 Per Cent

OCTOBER output of both beehive and by-product coke totaled 2,604,265 tons, or 84,288 tons per working day, representing a decrease of 9.1 per cent compared with the daily rate prevailing in September. Production for the 10 months ended Oct. 31 was 4,000,000 tons above that for the corresponding period of 1932. Stocks at by-product furnace plants advanced to 3,065,535 tons, or 2.7 per cent, during the month. Merchant plants increased their stock piles only 0.8 per cent. Visible supplies of all coke at the end of October were equivalent to 37.1 days' production at the current rate.

The National Association of Fan Manufacturers has opened an office at 5-208 General Motors Building, Detroit, to coordinate activities under the National Recovery Act. The new office will be in charge of L. O. Monroe, who has been identified with the industry since 1911.

### Gas-Powered Truck Makers Organize

THE Gas-Powered Industrial Truck Association has been organized with the following officers: President, Ezra W. Clark; vice-president, Clark Tractor Co., Battle Creek, Mich.; vice-president, L. J. Kline, general manager, Mercury Mfg. Co., Chicago; secretary-treasurer, John A. Cronin, 60 East Forty-second Street, New York. Directors include the president and vice-president, ex-officio, and the following additional members: D. H. Ross, Ross Carrier Co., Benton Harbor, Mich.; R. C. Howell, Howell Industrial Truck Co., Cleveland, and W. F. Hebard, W. F. Hebard Co., Chicago. A code of fair practice has been adopted and will be filed in Washington at once. The association has been elected to membership in Machinery and Allied Products Institute.

### Ford Exposition To Show in New York

MORE than 150 industries will be represented at the Ford Exposition of Progress to be held in the Port Authority Commerce Building, New York, beginning on Dec. 9, and sponsored by the Ford Motor Co., Detroit. The exposition will require six acres of floor space and will utilize more than 10,000 tons of equipment, which is being moved from Detroit, where the show was recently held.

The Ludlum Steel Co. will exhibit the products of their manufacture that are used in connection with Ford automobile construction.

The Bethlehem Steel Co. will actually manufacture steel at the exhibit and the Briggs Mfg. Co. will turn out 20 completed automobile bodies daily. Tremendous stamping presses and electric welding equipment are being installed in the Port Authority Building for this purpose.

In sharp contrast to the modern scientific developments which will be shown will be the original workshop of Henry Ford, a one-story brick structure which is being moved from Detroit. The lathe, drill press and other tools which Ford used in 1893 will also be on display, moved from Greenfield Village in Dearborn, where they form part of the permanent museum.

The exposition will also show a number of scientific devices, including a 280,000-volt X-ray device by means of which the public will have an opportunity to peer through solid steel. Electric eyes will count parts as they pour from a machine and the stroboscope, a device which by optical illusion slows down a motor which is turning thousands of revolutions per minute, and makes its parts look as though they were barely turning.

# Shippers Object To Demurrage Charges

STEEL traffic officials are concerned by a resolution recently adopted by the American Railway Association saying that "no change should be made in the demurrage rules on account of industrial operation under the National Industrial Recovery Act." According to Joseph H. Beek, Chicago, executive secretary of the National Industrial Traffic League, the application of codes under the NRA makes Saturday operation in many of the larger industries impracticable. Demurrage is a heavy penalty paid by receivers of freight for failure to unload cars promptly. Under such conditions, unloading cannot be undertaken on Saturday except under heavy penalty. Attempts had been made to have that day exempted from the demurrage penalty.

"Shippers will not be satisfied with this answer," according to Mr. Beek. "The National Industrial Traffic League, as the representative of a considerable portion of the bulk railroad tonnage of the country, does not feel that it is equitable to penalize these industries for compliance with what amounts to Federal law. We feel that where the NRA makes it im-

practicable for us to operate on Saturday, we should not be required to pay thousands of unearned dollars into the treasuries of the railroads because of that fact. The League intends to continue its efforts to correct this manifestly unfair practice."

## Sheet Steel Sales Off Sharply in October

SALES and production of sheet steel products in October registered declines, while shipments increased, according to the report of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. According to the report, which is based on figures covering a monthly capacity of 325,000 net tons, or approximately 59 per cent of the country's total capacity of 550,000 net tons, independent makers reported sales of 79,141 net tons in October, compared with 145,320 tons in September; production of 146,106 tons, against 180,304 tons, and shipments of 174,829 tons, compared with 163,634 tons. Unfilled tonnage on Nov. 1 amounted to 102,262 tons,

or 31.5 per cent of capacity, contrasted with 194,223 tons, or 59.8 per cent of capacity in September. The Oct. report with comparisons of the two preceding months in net tons follows:

	Sep-	October	September	August
Sales .....	79,141	145,320	158,830	
Production .....	146,106	180,304	203,893	
Shipments .....	174,829	163,634	174,480	
Unfilled orders .....	102,262	194,223	212,879	
Unshipped orders .....	52,978	61,566	64,583	
Unsold stocks .....	52,353	53,617	51,293	
Capacity per month .....	550,000	550,000	550,000	
Percentage reporting .....	59.0	59.0	59.0	

### Percentages, Based on Capacity

	24.4	44.8	48.9
Sales .....	24.4	44.8	48.9
Production .....	45.0	55.5	62.8
Shipments .....	53.9	50.4	53.8
Unfilled orders .....	31.5	59.8	65.6
Unshipped orders .....	16.3	19.0	19.9
Unsold stocks .....	16.1	16.5	15.8

## Steel Boiler Orders Higher in October

WASHINGTON, Dec. 5.—Orders for steel boilers totaling 440,261 sq. ft. were booked by 70 manufacturers reporting to the Bureau of the Census in October, as compared with 428,182 sq. ft. in the preceding month and with 232,403 sq. ft. in October, 1932. Bookings in the 10 months ended with October were 4,234,855 sq. ft. in 1933, 3,029,218 sq. ft. in 1932 and 6,043,147 sq. ft. in 1931.

## Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

**General Motors Corp.**, Broadway and Fifty-seventh Street, New York, has let general contract to Fred T. Ley & Co., Inc., 578 Madison Avenue, for one-story addition to plant at Tarrytown, N. Y., 80 x 300 ft. Cost over \$150,000 with equipment.

**City Council**, Knoxville, Tenn., W. W. Myratt, city manager, is arranging financing for \$3,225,000, authorized at special election, for new transmission line to Government hydro-electric power development at Muscle Shoals, Ala., with substations, switching stations and electric distributing system.

**General Purchasing Officer**, Panama Canal, Washington, asks bids until Dec. 11 for galvanized floor gratings, brass grilles and frames, wall bearing plates, cast iron flanges, gate valves, coil chain, pressure and vacuum gages, etc.; until Dec. 15, 25,000 ft. wire, 400 lb. magnet wire, 1000 ft. rigid steel conduit, 32,000 lin. ft. galvanized wire poultry netting, 20,000 lin. ft. copper wire cloth, transformers, electric motors, etc. (Specifications 2922 and 2923 respectively).

**Glenmore Distilleries Co.**, Louisville, will carry out expansion and improvements at plant at Owensboro, Ky., increasing capacity to about 500 bbl. a day. Work has been started on one-story blending plant. Entire project will cost over \$75,000 with equipment.

**Superintendent of Lighthouses**, St. George, Staten Island, N. Y., asks bids until Dec. 11

for six 350 mm. and 67 150 mm. acetylene lanterns, complete with acetylene flashers and burners, and 139 acetylene flashers for automatic light control.

**Matthew Brothers**, 115 Hopkins Place, Baltimore, manufacturer of corrugated paper boxes and containers, plans rebuilding part of five-story plant recently destroyed by fire. Loss about \$200,000 with machinery, latter representing close to \$75,000 of total.

**Board of Education**, Albany, Cal., plans manual training department in new high school. Cost \$150,000. Special election is called for Dec. 19 to vote bonds. Dragon & Schmidt, 3016 Telegraph Avenue, Berkeley, Cal., are architects.

**City Council**, McPherson, Kan., plans new municipal electric light and power plant, using Diesel engine-generating units. Cost \$200,000 with equipment. Federal loan is being arranged. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Dec. 12 for 10 screw-cutting lathes (Schedule 1296), two bench milling machines (Schedule 1295), precision toolmaker's lathe (Schedule 1329-B), eight milling machines, all motor driven, (Schedule 1297) for Washington Navy Yard;

700,000 ft. steel cable (Schedule 1315) for Philadelphia yard; until Dec. 15, motor-driven horizontal boring, milling and drilling machine (Schedule 1332) for Brooklyn yard; 50-kw. non-ferrous electric furnace (Schedule 1320) for Mare Island yard; boring and turning mill (Schedule 1335), plate scarfing and plate edge planer both motor driven (Schedule 1334) for Philadelphia yard.

**Fisher Brewing Co.**, Salt Lake City, Utah, has let general contract to Vincent-Peterson, Inc., 48 East Second Street, for extensions and improvements, including additional equipment. Cost over \$200,000 with machinery.

**Milwaukee Road** is adding to its list of machine tools published in THE IRON AGE, Nov. 30, page 36. New inquiries are for a 52-in. miller, 4-in. pipe threader, 2½-in. double-head bolt cutter, 72-in. heavy-duty boring mill, ½ to 4-in. drill grinder, universal reamer, 6-ft. squaring shear and 96-in. horizontal boring machine.

**A. J. Johnson Machine Works**, 619 Menomonee Street, Eau Claire, Wis., has placed contracts for a shop extension costing about \$15,000.

**John G. Bruenig**, Bloomer, Wis., has placed general contract with Hutter Construction Co., 128 Western Avenue, Fond du Lac, Wis., for remodeling manufacturing plant at Rice Lake, Wis., into brewery. Cost \$100,000, including new equipment.

**Princeton, Wis.**, voted at special election to issue \$125,000 in bonds for municipal waterworks and sewerage system. William Gore is mayor.

# PERSONALS

EUGENE W. PARGNY, since 1909 president of the American Sheet & Tin Plate Co., a subsidiary of the United States Steel Corp., has requested that he be relieved of his duties on Jan. 1, retiring under the corporation's pension plan. He entered the employ of the Apollo Iron & Steel Co. in 1890, continuing with that company and its successor, the American Sheet & Tin Plate Co., in various official capacities, and on Jan. 1, 1909, succeeded C. W. Bray as president.

C. W. BENNETT, vice-president of the company since 1925, and acting president since Jan. 1, 1933, has been recommended to be elected president by the finance committee of the Steel Corporation. He has been identified with the steel industry since 1892. His first occupation, after his graduation in mechanical engineering from the University of Wisconsin, was with the Marinette Iron Works, West Duluth, Minn., as a machinist. After a short period with the LaCrosse Plow Works, he associated himself with the mechanical department at the World's Fair. In 1894 he joined the Illinois Steel Co. as a draftsman and assistant to the master mechanic. Three years later he was made master mechanic of the American Tin Plate Co., later working up to the position of district manager. In January, 1906, Mr. Bennett was appointed assistant to C. W. Bray, president of the American Sheet & Tin Plate Co., and was advanced to the vice-presidency of the company in 1925.

WILBERT WARE, treasurer, Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has been elected president to succeed the late Charles B. Houck. He will also continue as treasurer, to which position he was elected in 1929. N. W. CASSEL, secretary, has been elected vice-president, continuing his duties as secretary. H. B. LIGGETT, heretofore general plant superintendent, has been appointed general manager.

FREDERICK C. CRAWFORD, first vice-president and general manager of Thompson Products, Inc., Cleveland, manufacturer of automotive parts, has been elected president, succeeding the late Charles E. Thompson. He became connected with the company in 1916, and, with the exception of one year of service in the United States Navy shortly following, has been identified continuously with the organization since that time. In 1922 he was appointed manager of the company plant at Detroit, where he remained until 1929, when he returned to Cleveland to become first vice-president and general manager. Mr. Crawford was



C. W. BENNETT

graduated from Harvard University in 1913 with the degree A. B., and two years later from Harvard Graduate School with the degree of M. C. E.

DR. FRANK CONRAD, assistant chief engineer, Westinghouse Electric & Mfg. Co., was recently awarded the John Scott Medal for scientific achievements by the City of Philadelphia.

## OBITUARY

ALEXANDER LEGGE, president of the International Harvester Co., and during the Hoover Administration chairman of the Federal Farm Board, died Dec. 3 of a heart attack while in his garden at Hinsdale, Ill. Mr. Legge would have been 68 years old on Jan. 13. He apparently had been in good health but had been working long hours on negotiations for an NRA



ALEXANDER LEGGE

code for the agricultural machinery industry. He was born of Scotch immigrant parentage on a farm in Dane County, Wis., where he received a short term of schooling. In 1891 Mr. Legge went to Omaha as a collector for the McCormick Harvester Co. Seven years later he went to Chicago as manager of the collection department. He was made manager of domestic sales in 1902 when the McCormick interests merged with others to form the International Harvester Co. In 1922 he was made president of the company.

Mr. Legge was the first chairman of the Federal Farm Board, devoting himself for 20 months to farm relief problems. He was a strong advocate of farmers' adjusting their production to demand and his efforts were directed toward organizing farmers so they could control their own marketing system. He is credited with the formation of the Farmers' National Grain Corp. and other important cooperative groups. Mr. Legge also served as vice-chairman of the War Industries Board. At one time he served as manager of the Allied Purchasing Commission. At Versailles he was one of President Wilson's economic experts.

TILLMAN D. LYNCH, formerly consulting metallurgical engineer, Westinghouse Electric & Mfg. Co., died at his home at Edgewood, Pa., on Nov. 27, aged 66 years. He was born in Harrison County, W. Va., and was graduated from Virginia University in 1891. After his graduation he became associated with G. W. G. Ferris & Co., engineers and contractors, of Pittsburgh, Chicago and New York. During the Spanish-American War Mr. Lynch was in the Bureau of Steam Engineers, United States Navy. In 1899 he joined the Westinghouse company, where he was in charge of manufacturing and metallurgical process until his recent retirement. He was formerly president of the American Society for Steel Treating.

GEORGE E. SEVEY, in charge of all railroad business for the Otis Steel Co., Cleveland, died Nov. 30, aged 75 years. His headquarters were at Chicago, where he had lived for about 50 years. Most of his business life was spent with the Otis company and he was widely known among railroad men.

JOSEPH BINKS, pioneer Chicago manufacturer, died Nov. 20 at Oak Park, Ill. Mr. Binks was born in Blackearth, Wis., in 1850 and moved to Chicago in 1869. He was regarded as an authority on steam appliances and for 27 years was chief engineer of a printing company in Chicago. In 1898 he developed a type of spray

(Continued on Page 58)



## THIS WEEK IN WASHINGTON

### Modification of Securities Act Intended To Stimulate Capital Goods Industries

**W**ASHINGTON, Dec. 5.—Flow of capital to heavy industries has been given a greater prospect as the result of President Roosevelt's recommendation to the Senate Committee on Banking that the securities law be amended. So stringent is the law as it now stands that it has been under vigorous attack for several months and held accountable for the flight abroad of capital and the almost complete stagnation of the securities market. Fear of the law is held responsible for the absence of the demand for long term bonds, on which the movement of capital goods largely depends. Charges have been made that refinancing of corporations has been impeded by operation of the law. Despite these attacks, however, Administration officials have been stoutly defending it. The move of the President in consequence came as a surprise. Nevertheless, it fits in with the Administration's efforts to stimulate the capital goods movement, the initial drive being through PWA loans to railroads. It is hoped that this Government direction will be followed by private enterprise, and apparently loosening of the securities act is intended to support this development.

The character of the modification of the act has not been disclosed. Chairman Fletcher of the Senate Committee, in discussing the President's recommendation, indicated that the commodity market may be included in proposed legislation following the committee's investigation of stock market enterprises. He did not, however, intimate the changes that may be made to comply with the President's recommendation to permit freer flow of capital to heavy industries. It is expected that the specific recommendations will be made by Henry Bruere, Administration coordinator for all credit activities.

Mr. Bruere is now engaged in a study of the securities act in order to determine how its provisions might

affect refinancing. It is believed he will appear before the Banking Committee before Congress meets on Jan. 3 and outline recommendations for changes. The President presented his recommendations to Senator Fletcher through Acting Secretary of the Treasury Morgenthau. Senator Fletcher said that while organized investment bankers believe provisions of the securities act should be modified, the interests of the public will be protected.

### Additional Codes to Be Effective This Week

**W**ASHINGTON, Dec. 5.—President Roosevelt on Nov. 27 approved codes of fair competition for the reinforcing fabricating materials, machine tool and equipment distributing, malleable iron, anti-friction bearing and pipe nipple manufacturing industries. The reinforcing fabricating materials and the pipe nipple manufacturing codes become effective Dec. 11; the machine tool and equipment distributing, Dec. 8; and the malleable iron and anti-friction bearing codes, Dec. 7. The hour and wage provisions of these codes are similar to others previously adopted and have been published heretofore in *THE IRON AGE*.

### Hearing on Zinc Code Scheduled for Dec. 8

**W**ASHINGTON, Dec. 5.—Public hearing on the code of the zinc industry as filed by the American Zinc Institute, Inc., representing approximately 98 per cent of the volume of the industry, will be held Dec. 8 at the Washington Hotel before Deputy Administrator W. A. Janssen.

The proposed code fixes a minimum wage rate of 35c. an hr. in the mining division for the Eastern and

Northwestern districts and 30c. an hr. in the Southern, Mississippi Valley and Southwestern districts; in the Prime Western Smelting division the minimum rate is fixed at 30c. an hr. for common or unskilled labor and \$2.75 per shift (of not to exceed 8 hr.) for all other labor. The minimum rate of wage for the high grade zinc division is fixed at 39c. an hr.; for the secondary zinc division, 35c. an hr., and for the rolled zinc, zinc alloy, zinc oxide, lithopone and sulphuric acid divisions, 35c. an hr.

The proposed code will establish a 42-hr. work week averaged over a period of 13 weeks, but in no case to exceed 546 hours in any 13-week period. Office, clerical and sales employees would work not more than 40 hr. per week averaged over a 13-week period. The maximum working hours shall not apply to executives and their immediate assistants, outside salesmen, supervising, technical, maintenance and engineering staffs.

### Steel Joist Code Hearing on Dec. 11

**W**ASHINGTON, Dec. 5.—Public hearing on the code of the steel joist industry will be held at the Willard Hotel on Dec. 11 before Deputy Administrator Barton W. Murray. The proposed code provides that except for executives and technical workers and their respective staffs receiving \$35 a week or over, truck drivers and those employed in emergency repair work, the maximum work week shall be 40 hr., averaged over a six months' period.

For the purposes of the code in the matter of wage rates the country is divided into 21 districts embracing states and parts of states. It is provided that in these respective wage districts the minimum rates of pay per hour for common labor shall be those fixed in the schedule, but such rates of pay shall not be understood to be the maximum rates of pay for the respective districts. Until this provision shall have been changed each member of the industry will pay its employees who on July 14, 1933,

were receiving a rate of pay per hour in excess of rate of pay per hour then being paid by such member for common labor, a rate of pay per hour which shall be at least 15 per cent greater than that which such employees were then receiving; provided, however, that this provision shall not be so construed as to require any member of the industry to make an increase in the rate of pay per hour in any wage district that will result in a rate which shall be higher than the rate paid to employees doing substantially the same kind of labor in the same wage district by any other member of the industry which shall have increased its rate in accordance with this provision.

These minimum rates of pay vary from 40c. an hr. in the Pittsburgh, northern Ohio, Detroit, Chicago and Colorado districts to 27c. an hr. in the Birmingham district and 25c. an hr. in the southern district which embraces the remainder of the South.

## Saw and Steel Products Code Hearing on Dec. 7

WASHINGTON, Dec. 5. — Public hearing on the code of the saw and steel products manufacturing industry is scheduled for Dec. 7, at the Willard Hotel. This code was filed by the Saw Manufacturers' Association of the United States, claiming to represent 86 per cent of the industry. Division Administrator Malcolm Muir will conduct the hearing.

The proposed code provides for a basic maximum work week of 40 hours averaged over 6 months for process and office workers. Provision is made that the 40-hour limitations shall not apply to those branches of the industry in which peak demand places an unusual burden for production upon such branches. In such cases employees are to be permitted to work 144 hours per year in excess of the limitations provided. The code also fixes a minimum wage of 30c. an hr. for female workers and 35c. for common labor, with 80 per cent of such minimum for learners and similar classifications and for old and partially disabled employees and watchmen.

## Steel Plate Orders Increased in October

WASHINGTON, Dec. 5. — New orders for fabricated steel plate, as reported to the Bureau of the Census by 48 identical manufacturers in October, amounted to 17,839 net tons, compared with 16,025 tons in September and with 16,737 tons in October, 1932. In the 10 months ended with October, orders were 169,626 tons in 1933, 144,418 tons in 1932 and 267,799 tons in 1931.

## Wage Rates Delaying P.R.R. Loan for Electrification—Other PWA Projects

WASHINGTON, Dec. 5.—Disagreement over wage rates to be paid by the Pennsylvania Railroad is delaying approval by the PWA of a loan of \$84,000,000 to complete electrification of the carrier's line between Wilmington, Del., and Washington. Col. H. M. Waite, deputy administrator in charge of engineering for the PWA, states that a question of law has arisen as to what rates should be paid and indicates that approval of the contract awaits settlement of the matter. Laborers working on projects financed by the PWA are receiving as much as 50c. an hour, said to be considerably higher than the Pennsylvania Railroad rate.

Meanwhile, the PWA in a list of non-Federal allotments totaling \$26,543,053, announced Friday, included \$11,900,000 for the Delaware River Joint Commission of Pennsylvania and New Jersey for construction and equipment of a rapid transit shuttle line across the Delaware River bridge between Philadelphia and Camden, N. J. The allotment, subject to a contract satisfactory to the PWA, includes a loan of \$10,000,000 and 30 per cent of the cost of labor and materials. Labor and materials are estimated to cost \$6,347,000. This project is part of a regional and interstate plan for development of the Philadelphia metropolitan area. The total length of the line will be approximately 2 1/3 miles. The Camden approach section will be about 3000 ft., the bridge section about 8200 ft., and the Philadelphia section 1000 ft. long. In addition to the construction work on trackage, approaches and other necessary facilities, the allotment covers the purchase of 26 rapid transit cars.

### Other Allotments Announced

Among other allotments for non-Federal projects are the following:

Westchester County, N. Y., \$2,100,000, loan and grant, for construction of an intercepting sewer connecting existing sewer and treatment plant; approximate cost, \$1,441,000; work can begin in 60 days.

Onandaga County, N. Y., \$1,650,000, loan grant for construction of intercepting sanitary sewer, sewage treatment plant, pumping station and outfall sewer; approximate cost of labor and material, \$1,173,000. Work can start in one month.

Jefferson City, Mo., \$1,500,000, grant, to Missouri State Highway Commission, to aid in widening, grading, paving and bridging approximately 159 miles of primary and secondary roads; total cost, \$6,474,438. Work can start at once.

Chicago, \$1,326,000, grant, to Board of Education, Cook County, to aid in completion of five high schools; total cost, \$5,338,415. Work can start at once.

Jacksonville, Fla., \$1,310,000, loan, to

Florida Ferry Co., for construction of steel truss and tower vertical lift bridge of low level type. Work can start in three months.

## Steel Casting Bookings Higher in October

WASHINGTON, Dec. 5.—October bookings of commercial steel castings, as reported to the Bureau of the Census by 128 manufacturers, were 23,608 net tons, as compared with 22,714 tons in the preceding month and with 11,896 tons in October, 1932. In the first 10 months of the year, orders were 208,361 tons, as against 129,580 tons in the corresponding 1932 period and 352,795 tons in 1931.

Production of castings by the same companies declined slightly in October from 25,532 tons to 25,459 tons, although output was more than twice the October, 1932, production of 12,531 tons.

## Saw Manufacturers' Code to Be Submitted

WASHINGTON, Dec. 1.—Hearing will be held Dec. 7 on the code of fair competition of the saw and steel products manufacturing industry, filed by the Saw Manufacturers' Association of the United States. Malcolm Muir, division administrator, will conduct the hearing.

The proposed code provides for a basic maximum work week of 40 hr., arranged over six months for process and office workers. Provision is made, however, that the 40-hr. limitation shall not apply to those branches of the industry in which peak demand places an unusual burden for production upon such branches. In such cases employees are to be permitted to work 144 hr. per year in excess of the limitation period.

The code also fixes a minimum wage of 30c. an hour for female workers and 35c. an hour for common labor, with 80 per cent of such minimum for learners and similar classifications and for old and partially disabled employees and watchmen.

Illinois Barge Line Co., a new corporation, has been formed to engage in contract transportation between Chicago, St. Louis and intermediate points on the Illinois Waterway. Donald S. Walker is president. The new company plans to award contracts for eight barges of special design to cost approximately \$100,000. Delivery of the barges is expected next February and operations will start Feb. 15.

# U. S. Steel Marks Reorganization Milestone

## Completion of Five Year Plan Seen in Redistribution of Executive Power

THE announcement of Myron C. Taylor's retirement as chairman of the finance committee of U. S. Steel Corp., and the succession of W. J. Filbert to this post was made in THE IRON AGE of Nov. 30, on page 56. Notification of this change was received by telephone and too late to permit of the incorporation of details.

The step in redistribution of executive power, which becomes effective Jan. 1, 1934, is significant in marking the completion of the reorganization plans which have occupied Mr. Taylor's attention for the past five years. He became chairman of the board in March, 1932, having held the chairmanship of the finance committee since December, 1927. Shortly after Mr. Taylor's election to the latter, he initiated a thorough study of the corporation's affairs. These included a minute review of the capital structure, the development of data previously unavailable concerning the physical structure, condition of equipment and properties, character of products manufactured and geographical relationship to present and prospective markets; the character and quality of the company's personnel; relation of all elements necessary to successful operation, etc. Having obtained facts at first hand, Mr. Taylor was then in a position to formulate a plan of reorganization which embraced three major phases.

First came the revision of capital structure, resulting in the reduction of funded debt, accomplished in 1929 by the redemption of \$340,000,000 par value of the parent company's bonds, which was effected partly through the sale of new shares of common stock and partly through the utilization of surplus, the redemption of \$30,000,000 par value of bonds of subsidiary companies. Through these redemptions total annual charges out of earnings ahead of United States Steel common stocks were reduced to \$29,000,000, or equal to about \$3 a share on common stock outstanding.

The second phase of Mr. Taylor's reorganization plan dealt with the revamping of the corporation's plants and physical properties and of more effectively adapting them to the prevailing and prospective conditions. Correlating and analyzing the results of many surveys it was possible to obtain an accurate gage in what sections of the country new developments might appropriately be made, what existing plants and properties might be, or had already become un-

desirable and should be abandoned, and to enable the greater concentration of operations so that a systematic plan of plant readjustment might be evolved. This, in turn, would be coupled with a budget system of appropriations whereby the financial requirements for plant rehabilitation and expansion might be anticipated with reasonable accuracy three years in advance.

The third phase of reorganization has applied to personnel. This has extended to executive positions as well as affecting all of the corporation's workers through the revision of the pension plan. Under this revision, which took place in 1931, 3000 employees have been retired on adequate pensions.

Mr. Taylor retains the chairmanship of the board and remains as chief executive officer of the corporation.

## Hoisting Engine Code Hearing Friday

WASHINGTON, Dec. 5.—Hearing on the code of fair competition for the hoisting engine manufacturing industry will take place on Friday before Divisional Administrator Malcolm Muir. The proposed code fixes a basic maximum work-week of 40-hr., except for technical and executive employees, except during peak demand. The proposed rate of pay is 40c. an hour.

Deputy Administrator Barton W. Murray will preside at a hearing next Monday on the code of the steel joist industry. It provides for a 40-hr. week, averaged over six months, and carries the same wage rates as those provided in the steel code.

## Navy Steel Awarded by Lot

WASHINGTON, Dec. 5.—The Navy Department yesterday awarded a contract for 293,610 lb. (146.8 net tons) of stainless steel for destroyer shields to the Crucible Steel Co. of America. Inasmuch as all the nine bidders submitted the same figure, \$105,284.80, for the total lot, the award was based on drawing lots. For 26,050 lb., the unit price was 36.77c. a lb., while on the remaining



MYRON C. TAYLOR

267,560 lb., the unit price was 35.77c. a lb. The steel is to be delivered to the Washington Navy Yard.

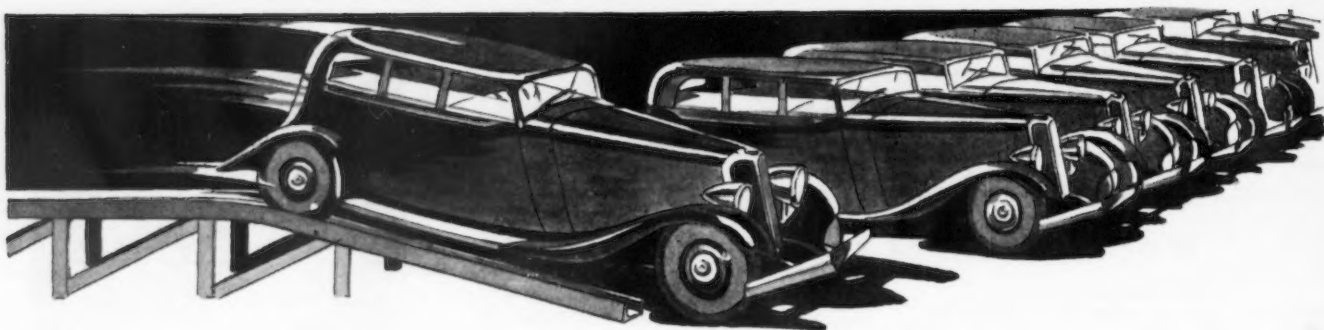
In addition to the Crucible company, the bidders were Allegheny Steel Co., Carpenter Steel Co., Illinois Steel Co., Jessop Steel Co., Latrobe Steel Co., Republic Steel Corp., Rustless Iron Co., and Universal Steel Co.

## Late Filing of Prices Raises Technicality

LATE filing of prices on certain steel products for first quarter raised a technical point which caused considerable discussion but had no actual effect on business. Under the code new minimum prices do not become legally binding until 10 days after they are filed. In the cases of wire and certain other products this meant that the legal effective date of the new first quarter prices was Dec. 4. However, the code does not prevent any company from putting advances into effect immediately if it chooses to do so. The only significance of the 10-day interim is that filing companies are not required to increase their prices before the expiration of that period.

## New Bids on New York Post Office Annex

WASHINGTON, Dec. 5.—The Treasury Department will take new bids on Dec. 27 for the construction of the midtown post office annex at New York, the former bids having been rejected. It is estimated that the structure will require about 6000 tons of steel.



## ▲ ▲ ▲ THIS WEEK ON THE ASSEMBLY LINE ▲ ▲ ▲

# Production Delays Slow Up Motor Car Assemblies

DETROIT, Dec. 5.

**D**ETROIT is watching with unusual interest the unprecedented spectacle of the automobile industry's publicizing its 1934 wares before they are publicly available. General Motors and Chrysler know that Ford intends to show his new V-eight series next Saturday and, as they are not yet in volume production of new models, are trying to induce buyers to hold off making purchases until their cars are ready. Hudson, likewise far behind in its retooling program, is endeavoring to stymie the market until its new Hudsons and Terraplanes are ready.

The truth is that production departments are meeting with the most serious delays in recent years, dealers representing some of the more important manufacturers have no new cars to sell, and some companies still are faced with the unpleasant fact of being compelled to go into the New York show with hand-built models.

Scarcely ever has the industry been in a tighter, more uncomfortable situation. Tools and dies are being completed with aggravating slowness, principally because the recent strike held up operations. In some cases key dies will not be in the hands of manufacturers until after Dec. 15.

Production departments have found it exceedingly difficult to swing into volume output of coil springs and other parts pertaining to the new front-end designs. Chevrolet, for example, is understood to be delivering to Flint this week the first new front-end units ready for assembly. It must be remembered that this is a radical innovation with which production departments are just becoming familiar.

To add to the industry's worries is the uncertainty about hours and

wages for next year. Leading executives felt a few months ago that they were doing the wise thing when they adopted a code which ran only until the end of the year, but they are not so sure now that they would not have been better off by having agreed upon a longer period. Reconsideration of the code inevitably means that labor will make further demands for higher wages, shorter hours and formal recognition.

William Collins, directing official at Detroit of the American Federation of Labor, charged automobile makers with bad faith in formation of company unions, in a speech recently at a Labor Institute conducted at the University of Michigan. This is representative of labor's present mood. Beneath a placid surface at Detroit there is considerable labor unrest, and the industry will breathe more easily if it gets into volume production with no outcroppings of labor trouble.

All of the factors mentioned are hampering automobile activities to such an extent that the December total is more obscure than a week ago. It probably will be another week or two before an accurate prediction can be made of the current month's assemblies. Ford, with a new car announcement at hand and with the necessity of stocking dealers, is increasing operations at Dearborn as rapidly as possible with a goal of 2000 units a day to be reached this week or next. Ford at the moment is the most active producer of cars.

It is said that the new Ford will have a cast alloy iron crankshaft as standard equipment. A growing percentage of Fords recently have been turned out with this type of crankshaft. An improved window ventilating system also will be a feature. Outward appearance will not differ

markedly from model 18, but the space inside the car will be greater.

### Chevrolet Increases Forces

Chevrolet has a normal force employed at its forge plant in Detroit, its foundry at Saginaw and its die casting plant at Bay City. About half of its employees at its other plants at Detroit, Flint and Toledo are at work. Assembly plants will begin to turn out passenger cars around Dec. 15. Delays make it improbable that output this month will be more than 30,000 units, if that high, and a considerable percentage of the total will be trucks. Until Chevrolet gets further into production no date will be set for introduction of its new models.

Aside from Chevrolet and Buick, which is going ahead at a fair rate, General Motors will have little to show in the way of assemblies this month. Pontiac will reveal its 1934 models to its field sales staff on Dec. 11, while Olds unveiled its car to its own sales force last week-end. However, neither car is likely to be out before the January shows. Cadillac is in the worst relative position in the corporation so far as new models are concerned.

If General Motors is in a tight place, its only comfort is said to be the fact that Chrysler's position is even tighter. Production of the Chrysler Corp'n. this month will be very light, and it is whispered that one or more divisions may have to go to New York with hand-made models.

### De Soto to Offer Radical Car

Preparing the way for the industry's first truly stream-lined car, De Soto is engaged in a publicity campaign in behalf of its forthcoming models. Says a statement about De Soto, "It is as exciting to look at and to ride in as a modern airplane." In its general design this car will not be unlike the Briggs "dream car" shown recently at the Ford show.

The motor of the new De Soto is located over the front axle, eliminating front axle bounce and equalizing distribution of weight. The rear seat

is ahead of the rear axle. Passengers therefore ride between the axles, whether they are in the front or rear seats. The frame and the body are a single unit. Instead of the body frame structure stopping at the cowl, as has been the practice in past automobile design, the body is trussed like a bridge, with the steel cross members extending to a point over the front axle. This construction is reported to make the front end as strong as the rear end, eliminating weaving, squeaks and rattles.

Budd will build the major stampings as well as body parts for the De Soto and likewise for the Chrysler, which it is said will be of the same radical design as the De Soto. Briggs is understood to be working now on new Plymouth bodies.

Studebaker, Nash and Ford are said to be investigating the flexible front-end construction already adopted for 1934 by Hudson. It is understood that this design is the invention of a local company which has licensed the Hudson company to use it on its Hudson and Terraplane cars.

#### Buick Deep in Small Car Program

Buick is deep in its program for its new small car which, according to reliable reports, is scheduled for an early spring debut. The necessary tooling for this job involves the rebuilding of a large amount of equipment and the purchase of a considerable volume of new machine tools, including drilling machinery.

Despite the handicaps confronting the industry in getting started on new models, a feeling of optimism pervades Detroit. Executives continue to talk in terms of three million and four million cars in 1934. Although four million seems a little steep, even the conservatives think that the three million mark is likely to be attained.

Fisher Body bought some steel the past week for Buick and Oldsmobile bodies. However, the tonnage in the aggregate now being purchased by the automobile industry is exceedingly meager. Improvement is anticipated the latter part of this month, but volume buying will not develop for at least 30 days more.

#### Citroen Purchases Here Necessary

Purchases of machine tools and dies now being made in this country by representatives of Andre Citroen, French automobile manufacturer, are not inspired by the present favorable exchange situation but by the necessity of buying production machinery for new models in the United States rather than in France. That is, the Citroen factory, by far the largest automotive plant in France, is tooled up on a mass production basis similar to American motor car plants and its officials are said to recognize the fact that the most satisfactory and efficient equipment for its production purposes can be bought here.

Citroen's American buying program

is not an unusual procedure, for large orders are placed in this country whenever the French plant is tooled up for new models. Its cars are equipped with welded all-steel bodies made in France through a licensing arrangement with the Edward G. Budd Mfg. Co. Some of its staff now visiting this country are spending most of their time at the Budd plant at Philadelphia, where it is understood the new body dies are being prepared.

It is officially stated that Citroen has no intention of contracting for American automotive parts to be shipped to France, as reported elsewhere. The cost of production in this country and the shipping expense to France, plus a high tariff, virtually prohibits the purchase of parts here.

#### Other French Buying Under Way

In addition to the Citroen program, which, as reported a week ago in THE IRON AGE, calls for a total expenditure of \$4,000,000 to \$5,000,000, representatives of the Peugeot Co., third largest French motor car maker, have been in this country for the past month to buy production equipment, including machine tools. M. Mathis, manufacturer of the Mathis car in France, also is in the United States presumably to place equipment orders. He was in Detroit in the past week. While the Mathis does not approach the Citroen or Peugeot in production volume, it is one of the better known French cars.

It is understood that inquiries have been made by one prospective French buyer of machine tools (not Citroen) regarding arrangements for payment for equipment over a period of nine months.

Domestic purchases of machine tools have expanded slightly, the automobile and electric refrigeration industries having ordered miscellaneous tools. A prominent machine tool builder reports bookings of seven machines in as many days, and states that the number of quotations being made from day to day is of encouraging volume.

#### Producers Stress Riding Comfort

Greater riding comfort will be an outstanding development in 1934 cars. It will be accomplished in General Motors and Chrysler cars by means of independent front wheel suspension and in the Terraplane and Hudson cars by the Axleflex front-end construction. The new Hupmobile, announced the past week, eliminates front end "wheel tramp" by a triangular system of steel tubes above and around the engine. This tubing system ties together the body, frame and front end so that stresses are neutralized.

The new Hupmobile has a tubular front axle and has been altered only slightly in appearance from 1933 models. Prices have been lowered \$100 to \$300, and range from \$795 to

\$1,145. Another Hupmobile, which may put the company in a much lower price field than ever before, is expected to make its debut later.

#### Selling Methods Compared

Observers are interested in watching during the coming year the diametrically opposed selling methods of General Motors and Chrysler. General Motors is convinced that the day of high pressure selling is ended, that buyers have been educated to know what they want and that they refuse to be "high-pressured" into buying what the manufacturer thinks they want.

It has recently completed the compiling of returns from 1,000,000 questionnaires sent out to car owners in which they were asked to specify their likes and dislikes. The characteristics which these owners desire are being built into General Motors 1934 cars, so that literally the corporation will be giving the motoring public what it has asked for.

Chrysler, on the other hand, apparently is choosing to adhere to the methods which were so successful the past year in gaining for it a higher proportion than even before of the automotive market.

The General Motors program is not the result of a sudden shift in merchandising policy. It has evolved from a modest beginning in General Motors of Canada two years ago. The plan of consulting the consumer's wishes was so successful there, carrying General Motors to top position in Canadian sales for the first time, that it has been extended to the corporation's activities in the United States.

## Cast Iron Pipe

Worcester, Mass., plans new pipe lines in Chandler, May and other streets for high-pressure water service. Cost about \$140,000. R. G. Lingley is city engineer.

Sudbury, Mass., plans pipe lines for water system. Cost about \$100,000. Fay, Spofford & Thorndike, 44 School Street, Boston, are consulting engineers.

Wingo, Ky., plans pipe line system for water supply. Application has been made for \$30,000 Federal loan.

McEwen, Tenn., plans water pipe line system and new waterworks station. Financing for \$50,000 is being arranged. Hart, Freeland & Roberts, Independent Life Building, Nashville, Tenn., are engineers.

Leighton, Ala., plans pipe line system for municipal water supply. Fund of \$31,000 is being arranged.

Ripley, Miss., plans pipe line system for municipal water service. Application has been made for \$40,000 Federal loan. Beard Engineering Co., 44 South Central Avenue, Clayton, Mo., is consulting engineer.

Phoenix, Ariz., plans extensions and replacements in pipe lines for water system. Special election will be held Dec. 9 to vote bonds for \$200,000.

Superior, Wis., Water, Light & Power Co. is inquiring for 4400 ft. of 24 or 30-in. for new water intake line under Superior Bay.

Noonan, N. D., plans 8255 ft. of 8-in. for municipal water supply; also, 50,000-gal. capacity steel tank on 100-ft. steel tower. Financing for \$27,000 has been arranged.

Almira, Wash., plans 4 to 8-in. pipe for water supply. Bond issue of \$15,000 has been approved. Otto Weile, 1818 Ninth Street, Spokane, Wash., is consulting engineer.

# Pig Iron Rate Off 17.3 Per Cent in November

**P**RODUCTION of coke pig iron in November totaled 1,085,239 gross tons, compared with 1,356,361 tons in October. The daily output in November, at 36,174 tons, dropped 17.3 per cent from the October daily rate of 43,754 tons.

There were 76 furnaces in blast on Dec. 1, making iron at the rate of 34,410 tons a day, compared with 79 furnaces on Nov. 1, operating at the rate of 39,755 tons a day. Ten furnaces were blown out or banked in November, while seven were placed in operation, making a net loss of three furnaces. The Steel Corporation showed no change in the total, having placed five furnaces in and five out; other steel companies blew in two furnaces and took five off blast.

Among the furnaces blown in are the following: One Carrie, two Duquesne, No. 4 Mingo, of the Carnegie Steel Co.; one Ensley, of the Tennessee Coal, Iron & Railroad Co.; one Steelton, of the Bethlehem Steel Co., and one furnace of the Ford Motor Co.

Furnaces blown out or banked include: One Clairton, one Ohio, No. 2 Mingo, of the Carnegie Steel Co.; one Lorain, National Tube Co.; one Fairfield furnace of the Tennessee Coal, Iron & Railroad Co.; one Lackawanna and one Cambria, of the Bethlehem Steel Corp.; one Donner, Republic Steel Corp.; one Riverside, of the Wheeling Steel Corp.; and one Weirton, National Steel Corp.

## Daily Average Production of Coke Pig Iron

	Gross Tons		
	1933	1932	1931
January .....	18,348	31,380	55,299
February .....	19,798	33,251	60,950
March .....	17,484	31,201	65,556
April .....	20,787	28,430	67,317
May .....	28,621	25,276	64,325
June .....	42,166	20,935	54,621
½ year .....	24,536	28,412	61,356
July .....	57,821	18,461	47,201
August .....	59,142	17,115	41,308
September .....	50,742	19,753	38,964
October .....	43,754	20,800	37,848
November .....	36,174	21,042	36,782
December .....	.....	17,615	31,625
Year .....	.....	23,733	50,069

## Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Ferromanganese†	
	Pig Iron*		1933	1932
	1933	1932		
January .....	568,785	972,784	8,810	11,250
February .....	554,330	964,280	8,591	4,010
March .....	542,011	967,235	4,783	4,900
April .....	623,618	852,897	5,857	481
May .....	887,252	783,554	5,948	5,219
June .....	1,265,007	628,064	13,074	7,702
½ year .....	4,441,003	5,168,814	47,063	33,562
July .....	1,792,452	572,296	18,661	2,299
August .....	1,833,394	530,576	16,953	3,414
September .....	1,522,257	592,589	13,339	2,212
October .....	1,356,361	644,808	16,943	2,302
November .....	1,085,239	631,280	14,524	5,746
December .....	.....	546,080	.....	7,807
Year .....	.....	8,686,443	.....	57,342

\*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.

†Included in pig iron figures.

## Merchant Iron Made, Daily Rate

1933	Tons	1932	Tons
January .....	2,602	January .....	6,256
February .....	2,863	February .....	7,251
March .....	2,412	March .....	7,157
April .....	1,908	April .....	5,287
May .....	3,129	May .....	4,658
June .....	4,088	June .....	6,090
July .....	6,783	July .....	3,329
August .....	7,756	August .....	3,070
September .....	10,034	September .....	3,213
October .....	8,634	October .....	4,286
November .....	7,639	November .....	4,435
December .....	....	December .....	3,674

## Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		December 1		November 1	
	November (30 Days)	October (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
<b>New York:</b>						
Buffalo .....	76,608	84,520	5	2,080	7	2,920
Other New York and Mass..	14,368	13,676	2	480	2	440
<b>Pennsylvania:</b>						
Lehigh Valley .....	24,604	26,248	2	820	2	845
Schuylkill Valley .....	22,332	22,278	2	745	2	720
Susquehanna and Lebanon Valleys .....	5,986	.....	1	350	0	.....
Ferromanganese .....	2,613	2,594	1	85	1	85
Pittsburgh District .....	221,515	277,516	14	7,415	11	7,005
Ferro. and Spiegel .....	4,410	9,144	1	145	2	295
Shenango Valley .....	16,360	30,779	1	545	1	420
Western Pennsylvania .....	15,572	18,292	1	445	2	590
Ferro. and Spiegel .....	7,501	9,652	1	250	1	310
Maryland .....	46,281	48,384	3	1,540	3	1,560
Wheeling District .....	84,564	85,723	3	1,865	5	2,980
<b>Ohio:</b>						
Mahoning Valley .....	75,274	146,846	4	1,965	5	3,340
Central and Northern .....	111,600	150,249	8	3,610	9	5,230
Southern .....	32,889	29,791	4	1,095	*4	1,130
Illinois and Indiana .....	176,047	240,537	10	5,870	10	6,905
Mich. and Minn. ....	33,010	30,637	3	1,235	2	990
Colo., Mo. and Utah .....	16,465	17,647	2	550	2	570
<b>The South:</b>						
Virginia .....	.....	.....	0	.....	0	.....
Kentucky .....	12,594	12,106	0	420	1	390
Alabama .....	84,646	99,742	7	2,900	7	3,030
Ferromanganese .....	.....	.....	0	.....	0	.....
Tennessee .....	.....	.....	0	.....	0	.....
<b>Total .....</b>	<b>1,085,239</b>	<b>1,356,361</b>	<b>76</b>	<b>34,410</b>	<b>79</b>	<b>39,755</b>

\*Revised. Globe Iron Co. blew in its furnace during October.

## Ohio River Shipments of Steel Increase

**S**HIPMENTS of iron and steel products on the Ohio River in the Pittsburgh district in October aggregated 49,047 net tons, compared with 38,480 tons in September, 69,531 tons in August, and 40,399 tons in October, 1932, according to the latest report of the United States Engineer Office, Pittsburgh. Total movements of steel products on the Monongahela River in October were 39,026 tons, compared with 43,026 tons in September, and 24,305 tons in October, 1932. Shipments of iron and steel on the Allegheny River last month totaled 4240 tons.

Because of wide popular interest, the metal cutting demonstration held at the Stevens Institute of Technology, Hoboken, N. J., on Dec. 7, will be repeated at 9.30 a. m., Saturday, Dec. 9. The demonstration is in honor of the fiftieth anniversary of the graduation of Frederick W. Taylor from the Stevens Institute.

## SUMMARY OF THIS WEEK'S BUSINESS

# Pennsylvania Railroad Places Orders for 140,000 Tons of Steel

### Large Purchase of Rails and Other Finished Products Is Feature of the Week—Production Rate Shows No Significant Change

**W**ITH ingot production still showing resistance to seasonal forces, the purchase of 140,000 tons of rails and other finished products by the Pennsylvania Railroad has added strength to the growing feeling of confidence in the iron and steel trade. The public works program continues to be a source of considerable tonnage, and the impending rebound in automobile output, although apparently delayed, promises to be sharp when it comes. Reflecting the outlook, scrap prices, although in most cases unchanged, have a steady undertone.

**A**LTHOUGH the steel production schedule at the beginning of the week was reported as 28.3 per cent, compared with 26.8 per cent seven days previously, actual operations are lagging somewhat behind schedules, averaging 27½ per cent, compared with 28 per cent a week ago. The change is apparently not a significant one, since declines in some centers were matched by gains in others. Output at Pittsburgh rose one point to 22 per cent of capacity and the rate in eastern Pennsylvania also increased a point to 19 per cent. Chicago is off two and one-half points to 24 per cent; Cleveland, three points to 39 per cent; and Buffalo, 13 points to 22 per cent. Elsewhere operations are substantially unchanged.

In the South, where steel output has remained at a 25 per cent rate since early in November, a substantial increase will occur next week when five additional open-hearths will be fired. In the same district two blast furnaces have resumed operations since Dec. 1, raising the total number of active stacks to 10, an operation not previously attained this year except during a short period in August.

**T**HE Pennsylvania Railroad has thus far distributed orders for 100,000 tons of rails and 40,000 tons of other finished products, including track accessories, plates, shapes and bars, and there is every indication that it will buy the remaining 19,000 tons called for in its inquiry for 159,000 tons. Of the rails, 50,000 tons went to Steel Corporation subsidiaries, 44,000 tons to Bethlehem and 6000 tons to Inland. The remaining 40,000 tons of steel was widely distributed.

While there are indications that many roads are reluctant to borrow from the Government unless conditions laid down as to collateral are relaxed, the transportation coordinator has apparently set no deadline for the submission of figures to be considered in connection with Federal rail loans. Hence it is the

hope of the steel trade that those roads which cannot buy their needs direct will eventually make application for loans. Meanwhile, a fair number of inquiries for track accessories are appearing, the Louisville & Nashville having entered the market for 1000 tons and the Erie for an unstated quantity. The Missouri Pacific has obtained court authority to purchase 25,000 tons of rails, together with necessary fastenings.

**A**UTOMOBILE production has encountered delays, both because of the setback in retooling suffered as a result of the tool and die makers' strike and difficulties incident to introducing new front-end spring suspensions. The outlook for output this month has become more obscure and it is by no means certain that recent forecasts of a December total of 125,000 cars will be fulfilled. In the meantime forward buying of steel by the motor car builders remains light, although scattered orders for sheets have been placed for both late December and January shipment.

Public works account for the lion's share of current structural steel awards, which total 22,300 tons, compared with 12,550 tons in the previous week. Federal construction activities are also reflected in a more active demand for steel from manufacturers of wheelbarrows, picks, shovels and road scrapers. Repeal of prohibition has resulted in increased business in cooperage hoops.

**A**DDITIONAL price changes are restricted to an advance on lap-weld steel boiler tubes, an increase of 10 per cent on cap and set screws, and a mark-up of \$6 a ton on screw bolts. Expected advances on bolts, nuts and rivets have not eventuated and may not be made. The possibility that pig iron prices in the Central West may be raised in line with the recent advances in the East has stimulated market activity.

Pig iron production in November totaled 1,085,239 tons, compared with 1,356,361 tons in October. The daily average in November, at 36,174 tons, declined 17.3 per cent from the October rate of 43,754 tons. Seventy-six furnaces were in blast on Dec. 1, as compared with 79 on Nov. 1, a net loss of three.

Recent price advances have raised THE IRON AGE composite for pig iron from \$16.61 to \$16.90 a gross ton, and the finished steel composite from 2.015c. to 2.028c. a lb. The scrap composite is advanced from \$9.92 to \$10 a ton.

# ▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Pig Iron

	Dec. 5, 1933	Nov. 28, 1933	Nov. 8, 1933	Dec. 6, 1932
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	<b>\$19.26</b>	\$18.26	\$18.26	\$13.34
No. 2, Valley furnace.....	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'ti.....	18.13	18.13	18.13	13.82
No. 2, Birmingham.....	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa. ....	<b>18.76</b>	17.76	17.76	13.50
Basic, Valley furnace.....	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh.	19.76	19.76	19.76	16.89
Malleable, Chicago* .....	17.50	17.50	17.50	15.50
Malleable, Valley .....	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago.....	23.54	23.54	23.54	23.17
Ferromanganese, seab'd car- lots .....	82.00	82.00	82.00	68.00

\*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Finished Steel

	Dec. 5, 1933	Nov. 28, 1933	Nov. 8, 1933	Dec. 6, 1932
<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.25	2.25	2.25	2.10
Hot-rolled annealed sheets, No. 24, Chicago dist. mill ..	2.35	2.35	2.35	2.20
Sheets, galv., No. 24, P'gh...	2.85	2.85	2.85	2.85
Sheets, galv., No. 24, Chicago dist. mill .....	2.95	2.95	2.95	2.95
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.75	1.55
Hot-rolled sheets No. 10, Chi- cago dist. mill .....	1.85	1.85	1.85	1.65
Wire nails, Pittsburgh .....	<b>2.35</b>	2.10	2.10	1.95
Wire nails, Chicago dist. mill	<b>2.40</b>	2.15	2.15	2.00
Plain wire, Pittsburgh .....	<b>2.20</b>	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	<b>2.25</b>	2.15	2.15	2.25
Barbed wire, galv., P'gh.....	<b>2.85</b>	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill .....	<b>2.90</b>	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh...	<b>\$5.25</b>	\$4.65	\$4.65	\$4.25

## Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$40.00
Light rails, Pittsburgh .....	32.00	32.00	32.00	30.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh .....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh .....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh ..	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh .....	<b>36.00</b>	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.60	1.60

## Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh....	\$11.50	\$11.50	\$11.50	\$8.75
Heavy melting steel, Phila....	<b>10.00</b>	9.75	9.75	6.75
Heavy melting steel, Ch'go...	8.50	8.50	8.75	5.25
Carwheels, Chicago .....	9.00	9.00	9.50	7.00
Carwheels, Philadelphia .....	10.75	10.75	10.75	9.25
No. 1 cast, Pittsburgh.....	11.25	11.25	11.25	9.50
No. 1 cast, Philadelphia.....	11.25	11.25	11.25	8.00
No. 1 cast, Ch'go (net ton)...	8.50	8.50	8.50	6.25
No. 1 RR. wrot., Phila. ....	11.00	11.00	11.00	7.50
No. 1 RR. wrot., Ch'go (net).	7.25	7.25	7.25	4.50

## Finished Steel

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh .....	1.75	1.75	1.75	1.60
Bars, Chicago .....	1.80	1.80	1.80	1.70
Bars, Cleveland .....	1.80	1.80	1.80	1.65
Bars, New York .....	2.08	2.08	2.08	1.95
Tank plates, Pittsburgh ....	1.70	1.70	1.70	1.60
Tank plates, Chicago .....	1.75	1.75	1.75	1.70
Tank plates, New York ....	1.98	1.98	1.98	1.898
Structural shapes, Pittsburgh	1.70	1.70	1.70	1.60
Structural shapes, Chicago..	1.75	1.75	1.75	1.70
Structural shapes, New York	1.95 1/4	1.95 1/4	1.95 1/4	1.86775
Cold-finished bars, Pittsburgh	<b>2.10</b>	1.95	1.95	1.70
Hot-rolled strips, Pittsburgh	1.75	1.75	1.75	1.45
Cold-rolled strips, Pittsburgh	2.40	2.40	2.40	2.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

## Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$3.75	\$3.75	\$3.75	\$1.75
Foundry coke, prompt.....	4.25	4.25	4.25	2.75

## Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	7.75	8.00	7.75	4.87 1/2
Lake copper, New York.....	8.00	8.25	8.00	5.25
Tin (Straits), New York.....	<b>53.75</b>	53.25	51.37 1/2	22.55
Zinc, East St. Louis.....	4.50	4.50	4.50	3.12 1/2
Zinc, New York.....	4.85	4.85	4.85	3.49 1/2
Lead, St. Louis.....	4.05	4.15	4.15	2.87 1/2
Lead, New York.....	4.15	4.30	4.30	3.00
Antimony (Asiatic), N. Y....	7.25	7.25	6.70	5.45

# ▲▲▲ The Iron Age Composite Prices ▲▲▲

## Finished Steel

Dec. 5, 1933	2.028c. a Lb.
One week ago	2.015c.
One month ago	2.015c.
One year ago	1.948c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1933 .....	2.036c., Oct. 3;	1.867c., Apr. 18
1932 .....	1.977c., Oct. 4;	1.926c., Feb. 2
1931 .....	2.037c., Jan. 13;	1.945c., Dec. 29
1930 .....	2.273c., Jan. 7;	2.018c., Dec. 9
1929 .....	2.317c., April 2;	2.273c., Oct. 29
1928 .....	2.286c., Dec. 11;	2.217c., July 17
1927 .....	2.402c., Jan. 4;	2.212c., Nov. 1

## Pig Iron

\$16.90 a Gross Ton
16.61
16.61
13.56

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1933 .....	\$16.90, Dec. 5;	\$13.56, Jan. 3
1932 .....	14.81, Jan. 5;	13.56, Dec. 6
1931 .....	15.90, Jan. 6;	14.79, Dec. 15
1930 .....	18.21, Jan. 7;	15.90, Dec. 16
1929 .....	18.71, May 14;	18.21, Dec. 17
1928 .....	18.59, Nov. 27;	17.04, July 24
1927 .....	19.71, Jan. 4;	17.54, Nov. 1

## Steel Scrap

\$10.00 a Gross Ton
9.92
10.00
6.92

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1933 .....	\$12.25, Aug. 8;	\$6.75, Jan. 3
1932 .....	8.50, Jan. 12;	6.42, July 5
1931 .....	11.33, Jan. 6;	8.50, Dec. 29
1930 .....	15.00, Feb. 18;	11.25, Dec. 9
1929 .....	17.58, Jan. 29;	14.08, Dec. 3
1928 .....	16.50, Dec. 31;	13.08, July 2
1927 .....	15.25, Jan. 11;	13.08, Nov. 22

# Steel Production Rises In Pittsburgh District



**Ingot Rate Up One Point to 22 Per Cent  
—Wheeling and Valley Rates Unchanged  
at 50 and 35 Per Cent Respectively**

**P**ITTSBURGH, Dec. 5—Miscellaneous demand for finished steel products has shown a scant improvement. The slight increase in specifications is occasioned largely by anticipatory covering against products in which higher prices become effective Jan. 1. Although the betterment thus far in December has not appreciably lifted aggregate volume, nevertheless any improvement in a month that usually witnesses a decline is considered to be a favorable omen. Moreover, announcements of higher prices for first quarter have probably not yet reached all steel consumers. As soon as the new prices are broadcast buyers are more generally expected to take stock of their requirements, and maximum specifications against present contracts are considered likely to appear by the middle of December.

Mill schedules in the first week of this month are holding their own. Heavy hot-rolled steel units are operating more regularly. Tin plate mills are maintaining their recent operating rate of 85 to 90 per cent, with little likelihood of revision before the end of the year. Sheet mill operations, at slightly above 30 per cent, are being maintained by a scattered improvement of orders from miscellaneous quarters. Strip mill operations are likewise sustained at about 30 per cent. The local rail mill is staggering its schedule this week on rails and sheet bars. Late reports today indicate that the Pennsylvania Railroad has allocated rail and steel orders against its recent 159,000-ton inquiry.

Ingot output in the Pittsburgh district has risen this week one point to 22 per cent. In the Wheeling district production is unchanged at 50 per cent. Operations in the Valleys and nearby northern Ohio mills are sustained at 35 per cent.

Prime materials markets, though quiet, are firm. Heavy melting steel is holding at \$11.25 to \$11.75. Low phosphorus pig iron has been advanced \$1 a ton.

## Pig Iron

Low phosphorus pig iron was advanced \$1 a ton on Dec. 1 to \$23, base, at Birdsboro, Steelton, Pa., and Standish, N. Y. The same increase will become effective on Dec. 8 at Johnson City, Tenn. Valley producers

of low phosphorus pig iron will base quotations at Steelton, the nearest basing point. The new prices are applicable to shipment through first quarter. Foundry, basic and Bessemer grades are now being quoted for that delivery at unchanged prices. Bookings and shipments are exceedingly light.

## Semi-Finished Steel

Although the \$1 a ton advance on wire rods for first quarter is expected to drive in a fair volume of specifications against fourth quarter contracts, no definite pick-up has been noticeable thus far. Demand for slabs and billets is dull. Movement of sheet bars to tin plate mills is holding up fairly well, but a sharp decline in such deliveries is expected by the middle of December. Non-integrated sheet mills manifest little interest in either prompt or forward requirements.

## Bolts, Nuts and Rivets

Prices for first quarter will probably be announced on or about Dec. 15. The dearth of current buying and contract specifications apparently indicates that most buyers are not particularly concerned with the possibility of higher prices, which are held to be foreshadowed by the increased cost of steel. The first quarter price policy will likely hinge chiefly upon business outlook. The railroad program at present offers the brightest prospect for large-lot buying.

## Warehouse Business

Common wire nails and cement coated nails have been advanced to \$2.65 per keg for delivery out of Pittsburgh warehouse, in line with the advances established by wire mills on Dec. 1. Warehouse prices for cold-finished bars and screw stock will probably be marked up in conjunction with the higher mill bases now established for spot and first quarter delivery.

## Bars

An expanding volume of specifications against contracts placed at the 1.60c. price is expected before the close of December. Releases thus far in the fourth quarter have not been particularly encouraging, but since 1.75c., Pittsburgh, will become firmly estab-

lished on all business on Jan. 1, most large buyers will undoubtedly specify fully against fourth quarter contracts. Fresh demand is spotty. Interest in forging bars is slightly improved.

The present Pittsburgh bases of 1.80c. for mill lengths, and 1.90c. for cut lengths, as quoted by distributors, have been extended for delivery through first quarter. The distributors' price for rail steel reinforcing bars in cut lengths will also remain unchanged for that period at 1.75c., Pittsburgh. Although demand has not improved, the usual amount of public works specifications continues to appear from day to day. A large tonnage of reinforcing steel will be required for approaches to the Triboro bridge at New York, but specifications for this work will probably not be issued until construction of the towers is well under way. New bids will be taken soon on the Pittsburgh post office ramps, which will require about 600 tons of reinforcing steel.

## Plates and Shapes

Specifications against plate contracts placed at 1.60c., Pittsburgh, are in greater evidence, but the improvement is far from significant. The current apathetic interest is laid to the general sluggishness in plate consuming lines. New barge construction and tank work is meager. The Pennsylvania Railroad is expected momentarily to place its requirements of plates, on which bids were taken Nov. 23. Other railroad requirements are insignificant. Although immediate prospects for demand are not encouraging, the possibility of an enlarged naval construction program offers some hope that next year a relatively active plate market will develop.

Projected lock construction on the Mississippi River accounts for a large share of new structural inquiry. Awards increased in the past week, with 4900 tons for a dam at Canton, Mo., placed with a local maker.

## Rails and Track Accessories

Early announcement of allocation of orders for steel rails and companion fastenings is expected to be made by the Pennsylvania Railroad, which opened bids on Nov. 23 on 159,000 tons of various steel products. Other carriers continue to issue inquiries for their requirements in track accessories. Prices on an unstated tonnage of fastenings are being requested by the Erie Railroad, and the Louisville & Nashville is inquiring for 1000 tons of various accessories. No deadline has yet been set by the transportation coordinator for the submission of figures on rail and accessory requirements for which loans are being sought. Meanwhile present prices on track accessories, with the exception of track bolts and screw bolts, have been reestablished for delivery through first half for acceptance prior to March 31. Screw bolts, which have

been quoted recently at about 4.10c. a lb., have been advanced to 4.40c. a lb., basing point, for first half delivery.

#### Wire Products

Specifications against fourth quarter orders have improved as a result of recent price advances. The improvement thus far, however, barely brings the daily volume up to a so-called normal level. Current demand emanates from various sources, with no consuming quarter predominant. Effective yesterday spot and first quarter contract business were quoted on the new bases at Pittsburgh and Cleveland.

#### Sheets

With present prices reaffirmed for first quarter delivery, consumers lack incentive to specify beyond their actual year-end needs. Nevertheless, a scattered improvement in specifications is noted, although aggregate volume of current business cannot be termed as significant. Little support is being offered by the automotive industry, which is apparently well covered for some weeks ahead. Renewed demand from that source is not looked for until after the close of the year. Large buyers are naturally restricting deliveries until after the coming inventory period. Sheet mills are engaged at about 25 to 30 per cent of capacity.

#### Strip Steel

Consumers with dangerously low stocks continue to specify against fourth quarter contracts. The aggregate volume of such business is still sufficient to sustain the recent improvement in demand for this product. There is no particular haste on the part of consumers, however, to cover beyond their actual needs, in view of the fact that current quotations of 1.75c. for hot-rolled strip, and 2.40c. for cold-rolled strip, Pittsburgh, will continue in effect for first quarter.

#### Tin Plate

Very little business has been booked for 1934 at the new price of \$5.25, Pittsburgh. Most producers are concerned at present with fulfilling heavy commitments at the old price before the close of the year. In view of the physical impossibility of accepting further commitments this year, most producers are refusing to take new tonnage offered for delivery in December. Operations are holding at 85 to 90 per cent of capacity.

#### Cold-Finished Steel Bars

Although specifications against fourth quarter contracts have not yet increased as a result of the \$3 a ton advance for first quarter, producers expect a marked expansion in demand by the middle of December. A number of large buyers, however, stocked heavily prior to the last advance, and long inventories in many cases may noticeably hold back some expected fourth quarter covering. The chief

reliance for prospective December business is the automotive industry.

#### Tubular Products

Base discounts on lap-welded steel boiler tubes have been announced for first quarter delivery as follows: 2 to 2¼ in., 33 per cent; 2½ to 2¾ in., 40 per cent; 3 in., 44 per cent; 3¼ to 3½ in., 47 per cent; 4 in., 49 per cent; 4½ to 6 in., 42 per cent. Despite the prospective increases in prices for first quarter on lap weld, as well as on seamless boiler tubes, specifications against fourth quarter contracts are coming in rather slowly. Producers of these products, however, expect a heavier demand by the middle of December. Line pipe and oil country goods are relatively quiet, although interest is still sustained by recent inquiries from Russia and from a Mid-West oil company.

#### Coke and Coal

Producers continue to quote \$3.75 a net ton on furnace, \$4.25 on standard brands of foundry, and \$5.25 on premium brands of foundry coke, at Connellsville ovens, for delivery through December. Current demand for both furnace and foundry grades

is extremely dull. Interest in the bituminous coal market is likewise negligible. Very little demand exists for mine-run steam coal and steam slack. By-product coking coal is the only grade which is currently active.

#### Scrap

Although no significant consumer buying has occurred during the past week, this market has lost none of its recent vigor. Dealer covering against recent orders constitutes the bulk of current trading. Very little scrap is coming out at current prices, and especially when dealer offerings fall below the quoted market. In order to draw out round tonnages, offering prices must more nearly match dealer asking prices. Occasionally a few scattered orders of No. 1 and No. 2 heavy melting steel are procurable at 25c. to 50c. a ton below the market, but these lots do not accurately gage the general market. Opening of bids this week on Pennsylvania and Baltimore & Ohio railroad lists is expected to reveal higher levels on heavy melting grades. Specialties continue to be firm. A recent sale of machine shop turnings substantiates the present quotation of \$7.50 to \$8.

## Output to Rise Sharply in South

**BIRMINGHAM, Dec. 5.**—Railroad tonnage booked by the Tennessee Coal, Iron & Railroad Co. is now of sufficient size to permit substantial expansion of the company's operations. Last week Robert Gregg, president, announced that the Ensley rail mill will resume on Dec. 13, with enough business on hand to operate on a reduced schedule until some time in January. No information as to the orders will be given out by the company, but it is known that inquiries have been active during recent weeks and that a large tonnage has been in prospect since the Government started negotiations with the railroads. It is believed that additional business will be placed before January and that steady operations are likely for a much longer period.

Reopening of the rail mill will bring into activity one additional coal mine, three additional blast furnaces, five additional open-hearth and two additional batteries of coke ovens. Production at three ore mines is also to be stepped up.

Last Friday, Ensley No. 3 blast furnace, banked since Oct. 10, resumed production, increasing the number of active stacks in the district to eight. The previous week the Tennessee company had blown in Ensley No. 5.

This week Fairfield No. 5, banked since Nov. 15, and Ensley No. 6, banked since Oct. 10, will resume operations. These two will give the district a total of 10 active furnaces

and will equal the high point of the year, reached for a short time in August.

One additional battery of 77 coke ovens of the Tennessee company resumed last week, increasing the company's total to 140, and the second battery of 77 will go back in this week, for a total of 217.

The five additional open-hearths will be at Ensley and will probably be fired about Monday, Dec. 11.

Business in wire products has been stimulated since the announcement of higher prices for the first quarter and a good month is expected, as many jobbers and dealers will rebuild their stocks at the lower prices now available, instead of waiting until after inventories at the end of the year. Since there were no advances in sheets there has not been much change in sheet volume. Actual bookings of bars, plates and shapes have also been backward, although fabricators state that the outlook is better, with more business in prospect than at any time in recent months.

Open-hearth operations are as yet unchanged, with six active, the same number as for several weeks previously.

#### Pig Iron

Books were opened Dec. 1 for first quarter business, with the price remaining at \$13.50. There is very little new business, but shipments remain good. December will prove another good month from the standpoint of deliveries, as all contracts must be completed or canceled by Dec. 31.

# Steel Output Declines to 24 Per Cent at Chicago



**Possibility of Price Advances Stimulates Forward Contracting in Pig Iron—Scrap Market Has Stronger Tone**

**C**HICAGO, Dec. 5.—Demand for finished steel, as measured by specifications and shipments, continues to drop, the current rate of decline being slightly sharper than that of the past few weeks. Ingot output now stands at 24 per cent of capacity, a drop of two and one-half points. This district also loses one active blast furnace, a unit having been banked by the leading producer. This situation is not unusual at this time of year, though sellers had hoped that by this time the rail buying program would have developed to the point where it would have eased the operating problem.

A strong factor in the market at this time is the impending inventory period. The incentive to reduce stocks is being offset by the advantage of taking commitments at savings in prices. However, neither shipments nor buying have gained momentum except in the case of pig iron, for which higher prices would not come as a complete surprise to melters.

The scrap market continues to make headway. Several steel mills have taken heavy melting steel, and railroad equipment makers, as well as automobile parts manufacturers, continue their activity in the market. Prices are leaning to the strong side.

## Pig Iron

Forward contracting for Northern foundry iron is under way at \$17.50. Prices are very strong, with many indications pointing to higher quotations in the not far distant future. Shipments are a shade higher than the November average. Low phosphorus iron is up \$1 a ton, base Johnson City, Tenn. The delivered price at Chicago is now \$28.65 a ton. The silvery market is quiet, though books have been opened for first quarter at current quotations.

## Reinforcing Bars

The code of the reinforcing materials fabricating industry has been signed by the President and will become effective Dec. 11. Old stocks of bars in the hands of dealers are exempt from the rules and at the present rate of shipments it will be some time before these stocks are out of the way. New cutting extras imposed on all new billet steel reinforcing bars have had the net effect of advancing

prices so that there is a 15c. spread between the new billet and rail steel bars. The tone of the market is improving as more Government work is let and private inquiries for small lots take a more prominent place.

## Rails and Track Supplies

This market is without feature except for the fact that the Federal Court at St. Louis has authorized the Missouri Pacific to purchase 25,000 tons of rails, together with tie plates and other accessories, all to be paid for out of earnings. The rail buying program announced earlier in the fall is for all intents and purposes at a standstill. Sellers are hoping that the rules now laid down as to collateral in the case of those railroads that must borrow will be relaxed. While this waiting attitude holds sway, some railroads that had signified their intentions to buy more than the minimum tonnages they could get along with are beginning to wonder if their promises were too generous. Western mills now doubt that December rail rollings will materialize in volume.

## Cast Iron Pipe

Fresh inquiries of size are lacking except for 4400 ft. of 24 and 36-in. pipe to be used for an intake at Superior, Wis. Small inquiries are increasingly numerous, the stimulant to this class of business being the PWA. Kenosha, Wis., has now definitely postponed its project until spring and tonnages at Chicago are still pending. Wilmette, Ill., is taking bids this week for a water line in conjunction with a new water plant that is nearing completion. All current business is moving at the newly established price levels.

## Plates

Demand has again turned very light and is responsible in a substantial way for curtailed output at some Western mills. Reports from the Southwest indicate that greater interest is being displayed in prospecting for new oil fields. Success in a few of these ventures can usually be counted on to revive the oil storage tank market. Little plate tonnage is being taken by oil producers. The PWA is expected to finance some water tank business but inquiries so far are lacking. On the basis of steel

demand it is quite evident that railroad shops are less active on heavy repairs to cars and locomotives. The Kansas City Southern will build 100 cars in its own shops, several private car operators have ordered 14 tank cars, and the United States Navy has purchased 23 cars of various types.

## Structural Material

Awards, at 1500 tons, are unusually light. They are composed almost entirely of scattered highway bridge jobs. Fresh inquiries total 7500 tons, including 3400 tons for three dams and locks on the Mississippi River and 1050 tons for a bridge for the Missouri Pacific. A growing number of small orders are directly traceable to the PWA.

## Wire Products

Shipments continue to gain slowly and producers expect this trend to continue until the end of the month, since users desire to take full advantage of commitments made at lower prices than those now prevailing. Spot purchases are light and first quarter contracting has not gotten under way. In fact, some observers believe that forward buying will drag until near the end of the year and then carry through into January. All new prices are now in effect and the industry is solidly on the new schedule.

## Bars

The bar market remains steady. Improvement hinges on the automobile industry, which is counting on a good year in 1934. Nash is preparing to enter the market with a new low-priced car for which a new name is to be selected. Betterment in the agricultural implement output is only nominal.

## Warehouse Business

Demand has been tapering since the fall peak, which occurred in the second week of November. However, the decline has been less sharp than usual for this season. Prices for track bolts and black annealed wire have been advanced.

## Scrap

Several small lots of heavy melting steel have been taken by consumers at \$8.50 a gross ton, delivered. Quality demanded and conditions surrounding the sales point to a firm price at \$8.75 for the No. 1 grade. Electric furnaces and malleable shops, both of which cater to railroad equipment manufacturers, remain in the market, and it is largely because of their interest that the complexion of the market as a whole has changed so materially in the last two weeks. Both heavy melting and cast iron borings are being accumulated for water shipment in the spring. The Rock Island is offering 89 cars and lists are out from a number of Eastern railroads.

# Steel Demand Maintained In New York District



**Miscellaneous Business and Public Works  
Awards Sustain Bookings at Unchanged  
Level—Anticipatory Specifying of Tin  
Plate**

**N**EW YORK, Dec. 5.—With all price changes for the first quarter now in effect, attention is again concentrated on the course of demand between now and Jan. 1. While it is believed that there will be heavier specifications against expiring contracts in those products which have been advanced, no tendency in that direction is yet apparent. Current business is mainly of a fill-in character, indicating that many consumers have exhausted stocks built up earlier in the year. The most encouraging feature of the current market situation is that business volume, low as it is, is showing no further decline as the time for year-end inventory-taking approaches. Apparently the minimum level for steel consumption is at a considerably higher point than it was during the depths of the depression early in the year.

Rail buying, so far as this district is concerned, is slow in materializing. Public works projects, however, are steadily approaching the stage where they will draw more heavily on steel mill output. Bids will be taken today on 12,000 tons of structural steel for 26 bridges involved in grade separation work at Syracuse, N. Y., for the New York Central Railroad. The Taylor-Fichter Steel Construction Co. has sublet most of the 12,500 tons for the towers of the Triboro bridge, New York, to the American Locomotive Co. General contract bids on the midtown post office annex, New York, 13,000 tons, have been rejected and new tenders will be asked.

Tin plate specifications have been stimulated by the recent price advance and it seems likely that first quarter business will suffer because of current accumulations. Steel companies are keeping in close touch with the Amtorg Co., but business from the Soviet Union is still a hope rather than a proximate possibility. Manufacturers of automotive specialties in this district are preparing to expand production appreciably in the first quarter.

## Pig Iron

Sellers in this district are busily shipping against pre-code contracts, and this movement is reflected in a contraction of new bookings. Sales

for the past seven-day period aggregated 1500 tons of December and 800 tons of early first quarter iron, compared with 2500 tons booked last week, and 3500 tons a fortnight ago. Melters have every monetary incentive to draw fully on old contracts, and furnaces expect cancellations in only a few cases as a result of poor credit. Since foundry stocks will be moderately heavy at the end of the month, new business in appreciable volume is not expected to develop before the middle of the first quarter. Current quotations on Lake Superior charcoal iron have been reaffirmed for first quarter delivery, but furnaces intimate that prices may be revised upward later in the month.

## Reinforcing Steel

First quarter prices on billet bars have been reaffirmed at 1.80c. a lb., Pittsburgh, for mill lengths, and 1.75c.

## Production Falls At Buffalo

**B**UFFALO, Dec. 5.—Three open-hearth were dropped from the active list at the Lackawanna plant of the Bethlehem Steel Corp. last Saturday and only three are operating this week. Republic Steel Corp. is operating four and Wickwire-Spencer Corp. has dropped one furnace. Seneca sheet division of Bethlehem is operating at about 35 per cent of capacity.

Reports are current that American Radiator Co. will resume operation this week at its major plant, following weeks of idleness brought about by labor troubles in the East.

Plans are coming out for a new \$1,000,000 project at Rochester, N. Y., known as the Rundell Memorial Library. Considerable fabricated structural steel is involved; also a tonnage of reinforcing bars, but nothing definite is yet known to prospective bidders. A local fabricator is low bidder for approximately 500 tons of Erie County bridges.

## Pig Iron

Pig iron inquiry has been small throughout the week, and makers have

for rail steel in cut lengths. Market prices continue firm, and the new code, operative on Dec. 11, will establish definite prices for accessories and fabricating, and prevent future shading of quotations. Awards last week included 400 tons of mesh for highways in New York and New Jersey, and about 300 tons of mesh and bars for a post office and highway structure in Massachusetts. Definite announcement is soon expected on 430 tons for the Ellis Island sea wall, and 340 tons for a Morris County, N. Y., highway job. Tonnages arising from various local Government financed projects will probably be delayed until spring.

## Scrap

The market undertone in this district is somewhat improved as a result of recent strength in outside selling markets. Domestic interest in cast and heavy melting grades is reviving, and yards are showing less inclination to release important tonnages of No. 1 and No. 2 heavy melting steel to exporters at the current price levels of \$7.50 and \$6.50 a ton respectively. Brokers' buying prices are unchanged on all grades except heavy breakable cast which has advanced 25c. to \$6.25 a ton as a result of steady purchases made at Jersey City for the Phillipsburg, N. J., melter. Most exporters were protected against the recent rally in dollar values, and foreign loadings at adjacent sea ports are expanding. Germany continues to take all desirable offerings of nickel bearing scrap.

now about abandoned the idea that there will be any great amount of activity during December. Shipments on old orders are going through without many holdups, indicating that the foundry melt is holding up. The announcement of higher eastern Pennsylvania prices affords Buffalo furnaces an opportunity to figure in parts of New England where they could not do so before.

## Scrap

Single-car inquiries for scrap are coming out, indicating that foundries are feeling out the market preparatory to placing larger lots. The inquiries are principally for short rails and malleable grades, and a few sales have resulted. Shipments on blast furnace scrap contracts are proceeding regularly, but one large consumer of No. 2 melting steel continues to hold up deliveries. The largest consumer, with low open-hearth operations and an accumulation of boat shipments, has assumed a waiting attitude.

Shipments of pure charcoal pig iron by the Superior Charcoal Iron Co., Grand Rapids, Mich., in the first 11 months of 1933 were 220 per cent of shipments for all of 1932.

# Public Work Aids Steel Demand at Cleveland



## Moderate Improvement Also in Orders From Automobile Industry—Ingot Output Declines to 39 Per Cent

CLEVELAND, Dec. 5—New demand from industries whose business has been sharply stimulated by the Federal public works program has contributed to a moderate improvement in the demand for finished steel. These industries include manufacturers of wheelbarrows, picks and shovels and road scrapers. While large tonnages are not consumed by these industries, some good orders have come from them, largely for bar products. Miscellaneous specifications also show a little improvement. Demand for sheets and strip steel has taken a slight upward turn.

Several automobile manufacturers have placed small tonnages during the week, some of the steel being for January requirements. Because of the time required in processing, deliveries of full-finished sheets against orders placed now cannot be made until about Jan. 1. Automobile companies do not appear to be ready to purchase round tonnages for production of their new models, but larger orders are expected from this source later in the month.

Ingot output in the Cleveland-Lorain territory dropped three points this week to 39 per cent of capacity, one local open-hearth furnace being taken off.

Operations of consuming industries not affected by the PWA program show little change. Railroads in this territory are purchasing no steel and are not expected to come into the market for rails for some time.

Buyers have shown no interest in first quarter contracts since the establishment of prices for that delivery. Cap and set screw prices have been advanced 10 per cent for December delivery. Bolt, nut and rivet manufacturers have not yet named first quarter prices.

### Pig Iron

A few sales in lots up to 500 tons have been made for the first quarter since Dec. 1; when the Lake furnaces opened their books for that delivery. While at present there is no expectation of an advance during the quarter, producers have the right under the code to change prices on 10 days' notice. Some consumers are now figuring out how much iron they probably will need for the quarter in excess of the tonnage that they will take in December against present

contracts. Shipping orders against pre-code contracts are expected to show considerable gain before Dec. 15, the deadline date for accepting these specifications.

### Iron Ore

Lake Superior iron ore shipments by water amounted to 21,623,898 gross tons during the past season, or slightly more than estimated last week before the final cargoes were shipped from Escanaba. The November movement was 778,877 tons, and an additional cargo of 5938 tons was shipped from Escanaba this month, making the total movement from that port for the season 205,949 tons. The 1933 movement compares with 3,567,985 tons shipped in 1932, or a gain of 506.54 per cent.

### Bars, Plates and Shapes

Demand for fabricated steel is limited to small orders for highway bridges and there is a scarcity of new construction projects in this territory, although a fair amount of work is in prospect. Miscellaneous orders for bars are more numerous and include some automobile tonnage. The recent improvement in small-lot plate orders, largely for boiler shops, is being maintained.

### Sheets

The market shows a little more life in both orders and inquiries. Some new business was placed by the automotive industry during the week, both for late December and for January shipment. None of these orders was for round tonnage, indicating that the automobile manufacturers do not care to make heavy commitments at present. Refrigerator manufacturers also placed some orders, and more business is in prospect from this source. A number of orders have come from makers of steel barrels and road scrapers.

### Strip Steel

Specifications and inquiry for both hot and cold-rolled strip show improvement. Some new inquiry has come from stamping plants that are figuring on automobile business. New business has been placed for cooperation hoops, and makers expect that the repeal of prohibition will result in considerable demand for that product. At present there is a shortage of barrel staves and heads, but the

supply will be more plentiful shortly, when wood now in the process of drying is suitable for assembling into barrels. Some new business has come from the Pacific Coast for hoops for wine barrels.

### Bolts, Nuts and Rivets

The automotive industry placed some good orders during the week at the prices that have been effective since Oct. 15. In view of the 10 per cent advance on that date, there is now some uncertainty whether prices will be marked up further for the first quarter. Rivet manufacturers, who will have to pay \$3 more per ton for their stock during the coming quarter, have not yet decided whether to advance prices for that delivery. Cap and set screw prices have advanced 10 per cent, the new prices to apply until Jan. 1.

### Scrap

Pipe foundries are getting busier on municipal work and this has resulted in some demand for agricultural machinery cast scrap.

## Hawaii Awards Are Feature on Coast

SAN FRANCISCO, Dec. 4—Awards of Government projects at Pearl Harbor, T. H., constituted the major booking of the week. The Pacific Coast Steel Corp. took 6000 tons of reinforcing bars for the Pearl Harbor pier and quay walls, while 350 tons of structural steel for the foundry building was let to the Virginia Bridge & Iron Co. With the general contract for the Pearl Harbor improvements awarded, further contracts should be placed shortly for 1000 tons of structural steel and 400 tons of reinforcing bars.

The award of 2700 tons of structural steel for hangars at Hamilton Field, Cal., has not yet been confirmed, and 4600 tons of steel for the Federal building at San Francisco is still pending. Lettings during the week aggregated 637 tons of structural steel and 6571 tons of reinforcing bars.

With specifications completed at Oakland, Cal., for the Park Street bridge, bids will be taken shortly on this project, which will require 1450 tons of structural steel and 550 tons of bars. A total of 2781 tons of structural steel was added to the pending list, while new reinforcing bar inquiries aggregated 1506 tons.

The National Institute of Used Machinery and Equipment Dealers will hold an adjourned meeting for the election of officers and directors for the ensuing year and authorization of filing the code, Dec. 9, at 10.00 a. m. in the William Penn Hotel, Pittsburgh. Mary Graham Wagner, 406 Empire Building, Pittsburgh, is acting secretary.

# Pennsylvania Places Large Rail and Accessory Orders



## United States Steel, Bethlehem and Inland Share 100,000 Tons of Rails—Track Supplies and Rolled Steel Widely Distributed

**P**HILADELPHIA, Dec. 5.—Award yesterday of 100,000 tons of rails and approximately 40,000 tons of track accessories and rolled steel by the Pennsylvania Railroad is the feature of the local steel market. Although definite information regarding the distribution of the orders is lacking, the subsidiary companies of the United States Steel Corp., are believed to have received 50,000 tons of rails, the Bethlehem Steel Co., 44,000 tons, and the Inland Steel Co., 6000 tons. The accessories were placed largely with companies which do not produce rails, and the bars, plates, shapes and sheets for the construction of 500 automobile box cars at the Altoona, Pa., shops went to several makers. In all cases contracts for definite tonnages were signed by the railroad and provision was made for full compliance with commercial resolutions 29 and 34 which supplement the steel code.

The Pennsylvania is expected to make inquiry this week for a considerable tonnage of rolled steel for its usual quarterly maintenance requirements, but no definite information is available regarding the steel required for the 6500 additional freight cars for the building of which a loan has been secured from the PWA. Continuation of the railroad electrification program from Wilmington, Del., to Washington is also delayed, presumably because of disagreement over wages to be paid for work to be done with PWA funds. No other railroad business has appeared in this district, but miscellaneous demand is well sustained, and steel ingot production has risen, for the second consecutive week, to 19 per cent of capacity.

### Pig Iron

Following the placing of a considerable number of small orders for December delivery, the market has been quiet since the first of the month. No interest in first quarter contracting is being shown and the new prices have had no test. Specifications against old contracts are well sustained.

### Bars, Plates and Shapes

Producers in this district have already begun to experience a slight increase in their specifications as consumers take out tonnage called for in their fourth quarter contracts. This

business is expected to increase as the month progresses and December will probably show a reversal in the usual seasonal trend of business. The Pennsylvania Railroad's order for heavy hot-rolled products will benefit some mills this month. Award of nine coast guard cutters by the Navy Department has been postponed and the bids may be thrown out. Shipyards bid differently on this work, some assuming that code labor rates should rule, while others met the requirements of the PWA. No announcement has been made regarding the bids submitted on plates and shapes for two cruisers and two gunboats to be built in navy yards.

### Sheets

The principal consumers of automobile body sheets in this district

## Pig Iron and Sheets More Active at Cincinnati

**C**INCINNATI, Dec. 5.—Renewed rumors of impending price advances on Northern iron for first quarter have stimulated forward buying and bookings for the week reached about 800 tons. Rising prices of gold, combined with higher pig iron quotations in other areas, have caused melters to look for an upward readjustment of Northern schedules, despite the recent reaffirmation of present quotations. Southern furnaces, however, have formally opened books for first quarter at unchanged prices. These quotations are still based on a schedule 38c. below delivered prices from the nearest Northern competitor.

Foundry operations are slightly lower. The melt in stove foundries is off, following the usual seasonal reaction, while machine tool melters are still without appreciable demand. A central Indiana melter has bought 200 tons of Northern foundry iron for first quarter shipment, while a central Ohio consumer has contracted for 150 tons. A southern Ohio melter has closed for 100 tons of Southern iron. Inquiry is nil.

### Steel

An improvement in the miscellaneous sheet demand has raised the level of bookings to about 35 per cent of

have not increased their requirements, but will soon announce production schedules. Demand for sheets from other sources is quiet, but no further contraction is reported. The possibility of price advances during the first quarter gives the market a strong tone.

### Warehouse Business

Local warehouses have advanced prices on practically all products except sheets in accordance with higher mill prices which they will have to pay after the end of the month. Bars, plates and shapes are now quoted at 2.75c., out of Philadelphia warehouses. Hot-rolled annealed sheets, No. 10 gage, have been advanced to 2.95c., as warehouses have adopted the mill practice of establishing prices on flat-rolled products. Warehouse demand is fairly well sustained.

### Scrap

Purchase of about 5000 tons of No. 1 heavy melting steel by a nearby melter at \$10 has strengthened the market appreciably. Another buyer is now offering the same price, but dealers are reluctant to take additional orders. The export movement out of the district continues, although it may cease if local consumer interest holds up. Machine shop turnings are stronger on the basis of a sale into consumption at \$6.50. Stove plate is also quotable at a higher level.

mill capacity. There has been a renewal of buying for electrical refrigerators, following the completion of new model plans, but automobile manufacturers are still reluctant to enter the market. Rolling schedules are in keeping with demand, but mills are holding surplus inventories to a safe level.

### Scrap

Reluctance of consumers to increase inventories is depressing the scrap market. Prices are steady, but the undertone is soft. A fair amount of material remains to be delivered on old commitments.

## Detroit Scrap Market Quiet

**D**ETROIT, Dec. 5.—Although consumer buying of scrap remains practically at a standstill, local dealers are more active purchasers of available stocks, which at the moment are relatively small. The trade is somewhat apprehensive about prices in case heavier production of scrap in the next 30 days is not accompanied by a corresponding increase in demand from steel mills. However, the general feeling is that prospective expansion of steel operations will result in considerable contracting for scrap early in January. Quotations are unchanged, with heavy melting steel bringing \$6.75 to \$7.25 a ton.

# Prolonged Consumer Apathy Forces Copper and Lead Quotations Downward

Spelter Bookings Advance to 3000 Tons; Price Unaffected by  
Brief Tri-State Ore Curtailment—Tin Moderately Active

NEW YORK, Dec. 5.—Sporadic shading of electrolytic copper resulted in a general unsettlement of the price structure last week, and offerings are now officially priced 25 points lower at 8c. a lb. for arsenical Lake and electrolytic, delivered Connecticut points. Fabricators continue disinclined to make important commitments, but the stagnant domestic condition is fortunately partially offset by a well maintained buying wave in England and on the Continent. Exchange variations are naturally affecting the monetary return on foreign bookings, and during the week equivalent cent prices varied from 7.62½c. to 7.95c. a lb. c.i.f. usual Continental base ports. The announcement that a revised and comparatively satisfactory copper code will be presented in Washington this week was received in a somewhat cynical man-

ner by the trade. The new provisions are indefinite but are said to include allocation of sales to fabricators and controlled stock liquidations. Apparently no attempt will be made to establish or regulate a minimum market price.

## Tin

Domestic consumers and dealers continue to purchase moderate tonnages of Straits and English brands for spot and first quarter delivery despite the impeding influence of sterling-dollar variations. With the pound priced at \$5.19 late today, spot Straits was freely offered at 53.75c. a lb., New York, and, on the strength of continued stock reductions, London quotations advanced about £2 to today's first call postings of £227 2s. 6d. for spot and £227 5s. for future standard, and £231 10s. for the East-

ern market. November American tin deliveries totaled 3350 tons, which was the lowest figure since March and about 100 per cent under the October total. Imports for the 11 months aggregated 54,600 tons, representing a tonnage almost equal to that for the similar 1931 period, and about 100 per cent above the imports for the corresponding 1932 period. Continental deliveries for the 11 months were also well above those for the same period in 1932.

## Zinc

Trading in spelter continues uninteresting, with current activity limited to routine carlots at a steady but not particularly firm price level of 4.85c. a lb., New York, and 4.50c., East St. Louis. Sales of Prime Western during the past seven-day period advanced to about 3000 tons at 4.50c. for prompt and February metal. Although many sources ignore March inquiries, that position is available at 4.50c. if a sizable tonnage is spread over the full first quarter. Despite a heavy ore curtailment, Joplin concentrates are still available at \$28.50 to \$30 a ton. The week's sales of 2600 tons were 700 tons greater than output, but as mining operations return to the old level next week, it is expected that production will again rise to the 7000-ton level. Visible ore stocks continue above the 10,000-ton point, and, notwithstanding the voiced intention of mines to limit offerings, there seems small doubt that the lack of ore strength will again bear heavily upon the refined metal market.

## Lead

A 25-point price decline was registered in the New York market late last week in response to an unfavorable statistical trend and a general unwillingness of users to make future commitments. An immediate spirited buying response was evidenced, and yesterday quotations rebounded \$2 a ton to the current price basis of 4.15c. a lb., New York, and 4.05c., St. Louis. It is interesting to note that major St. Louis interests are again maintaining a 10-point instead of a 15-point price differential. January books are nominally open, but current trading is practically limited to prompt and nearby supplies, and December requirements are about 50 per cent sold.

The average prices of the major non-ferrous metals for November, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.*...	7.91c. a lb.
Lake copper, New York.....	8.16c. a lb.
Straits tin, Spot, N. Y.....	53.14c. a lb.
Zinc, East St. Louis.....	4.52c. a lb.
Zinc, New York.....	4.87c. a lb.
Lead, St. Louis.....	4.15c. a lb.
Lead, New York.....	4.29c. a lb.

\*Refinery quotations; price ¼c. higher delivered in Connecticut.

## The Week's Prices. Cents Per Pound for Early Delivery

	Nov. 29	Dec. 1	Dec. 2	Dec. 4	Dec. 5
Electrolytic copper, N. Y.*....	8.00	7.75	7.75	7.75	7.75
Lake copper, New York.....	8.25	8.00	8.00	8.00	8.00
Straits tin, Spot, N. Y.....	53.30	53.50	53.50	53.00	53.75
Zinc, East St. Louis.....	4.50	4.50	4.50	4.50	4.50
Zinc, New York.....	4.85	4.85	4.85	4.85	4.85
Lead, St. Louis.....	4.05	3.95	3.95	4.05	4.05
Lead, New York.....	4.15	4.05	4.05	4.15	4.15

\*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb., delivered; New No. 12, 18.50c. a lb., delivered. Aluminum, remelt No. 12 (alloy), carload lots delivered, 12c. a lb., average for week. Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered. Antimony, 7.25c. a lb., New York. Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

## From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.....	55.00c. to 56.00c.
Tin, bar.....	57.00c. to 58.00c.
Copper, Lake.....	9.25c. to 10.00c.
Copper, electrolytic.....	9.00c. to 9.50c.
Copper, castings.....	8.75c. to 9.75c.
*Copper sheets, hot-rolled.....	17.12½c.
*High brass sheets.....	14.75c.
*Seamless brass tubes.....	16.37½c.
*Seamless copper tubes.....	16.62½c.
*Brass rods.....	12.25c.
Zinc, slabs.....	6.00c. to 7.00c.
Zinc sheets (No. 9), casks.....	9.75c. to 10.00c.
Lead, American pig.....	5.12½c. to 6.12½c.
Lead, bar.....	6.12½c. to 7.12½c.
Lead, sheets.....	8.00c.
Antimony, Asiatic.....	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus.....	23.30c.
Alum., No. 1 for remelt-ing, 98 to 99 per cent.....	18.00c. to 19.00c.
Solder, ½ and ½.....	31.00c. to 32.00c.
Babbitt metal, commercial grade.....	25.00c. to 60.00c.

\*These prices are also for delivery from Chicago and Cleveland warehouses.

## From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	55.75c.
Tin, bar.....	57.75c.

Copper, Lake.....	9.25c. to 9.375c.
Copper, electrolytic.....	9.25c. to 9.375c.
Copper, castings.....	9.25c.
Zinc, slab.....	5.75c. to 6.00c.
Lead, American pig.....	5.00c. to 5.25c.
Lead, bar.....	8.00c.
Antimony, Asiatic.....	9.00c.
Babbitt metal, medium grade.....	19.75c.
Babbitt metal, high grade.....	60.50c.
Solder, ½ and ½.....	32.50c.

## Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	6.25c.	7.25c.
Copper, hvy. and wire.....	6.00c.	7.00c.
Copper, light and bottoms.....	5.00c.	5.75c.
Brass, heavy.....	3.50c.	4.00c.
Brass, light.....	3.00c.	3.50c.
Hvy. machine composition.....	4.50c.	5.125c.
No. 1 yel. brass turnings.....	4.25c.	5.00c.
No. 1 red brass or compos. turnings.....	4.00c.	4.75c.
Lead, heavy.....	3.00c.	3.50c.
Zinc.....	2.50c.	3.00c.
Cast aluminum.....	7.25c.	8.50c.
Sheet aluminum.....	11.25c.	12.75c.

# Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

## BARS, PLATES, SHAPES Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh mill	1.75c.
F.o.b. Chicago or Gary	1.80c.
Del'd Philadelphia	2.04c.
Del'd New York	2.08c.
F.o.b. Cleveland	1.80c.
F.o.b. Buffalo	1.85c.
F.o.b. Birmingham	1.90c.
F.o.b. cars dock Pacific	2.30c.
F.o.b. cars dock Gulf ports	2.15c.

Rail Steel	(For merchant trade)
F.o.b. Cleveland	1.70c.
F.o.b. Chicago	1.70c.
F.o.b. Gary	1.70c.
F.o.b. Pittsburgh	1.65c.
F.o.b. Buffalo	1.75c.
F.o.b. Birmingham	1.80c.

Billet Steel Reinforcing	(Stock lengths as quoted by distributors; cutting to length, 60 in. and over takes extra of 10c. per 100 lb.)
F.o.b. P'gh mills	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Youngstown	1.85c.
F.o.b. cars dock Pacific ports	2.35c.
F.o.b. cars dock Gulf ports	2.20c.
(Cut lengths as quoted by distributors)	
F.o.b. Chicago	1.95c.

Rail Steel Reinforcing	(Cut lengths as quoted by distributors)
F.o.b. Pittsburgh	1.75c.
F.o.b. Cleveland	1.80c.
F.o.b. Chicago	1.80c.

Iron	
Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Phila.	1.89c.
Common iron del'd New York	1.83c.

Steel Car Axles	
F.o.b. Pittsburgh	2.50c.
F.o.b. Chicago	2.50c.

Tank Plates	Base per Lb.
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Birmingham	1.85c.
Del'd Cleveland	1.85c.
Del'd Philadelphia	1.85c.
F.o.b. Coatesville	1.80c.
F.o.b. Sparrows Point	1.80c.
Del'd New York	1.98c.
F.o.b. cars dock Pacific ports	2.25c.
F.o.b. cars dock Gulf ports	2.10c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates	
F.o.b. Pittsburgh	3.20c.
F.o.b. Chicago	3.25c.

Structural Shapes	Base per Lb.
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.80c.
F.o.b. Bethlehem	1.80c.
Del'd Cleveland	1.85c.
Del'd Philadelphia	1.90c.
Del'd New York	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports (stand- ard)	2.25c.
F.o.b. cars dock Pacific ports (wide flange)	2.35c.

Steel Sheet Piling	Base per Lb.
F.o.b. Pittsburgh	2.00c.
F.o.b. Chicago mill	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Alloy Steel Bars	
F.o.b. Pittsburgh, Chicago, Buffalo, Beth- lehem, Massillon or Canton.	
Open-hearth grade, base, 2.45c. a lb. ex- cept at Bethlehem where the price is 2.55c. S.A.E.	
Series	Alloy
Numbers	Differential per 100 lb.
2000 (1/2% Nickel)	\$0.25
2100 (2 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/4c. per

lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Cold Finished Bars*	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.15c.
Bars, Cleveland	2.15c.
Bars, Buffalo	2.20c.
Bars, Detroit	2.30c.
Bars, eastern Michigan	2.35c.
Precision round bars, Pittsburgh	2.30c.
Precision round bars, Cleveland	2.35c.
Precision round bars (alloy), Pitts.	3.00c.
Shafting, ground, f.o.b. mill	
1-3/16 to 1 1/2 in.	3.40c.
1-9/16 to 1 1/4 in.	2.90c.
1-15/16 to 2 1/4 in.	2.75c.
2-1/16 to 6 in.	2.45c.

\* In quantities of 10,000 to 19,000 lb.

## SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets	Base per Lb.
Hot Rolled	
No. 10, f.o.b. Pittsburgh	1.75c.
No. 10, f.o.b. Gary	1.80c.
No. 10, del'd Phila.	2.04c.
No. 10, f.o.b. Birmingham	1.90c.
No. 10, f.o.b. dock cars Pacific	2.42 1/2c.

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.25c.
No. 24, f.o.b. Gary	2.35c.
No. 24, del'd Phila.	2.54c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, f.o.b. dock cars Pacific	2.95c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.30c.
No. 10 gage, f.o.b. Gary	2.40c.
No. 10 gage, del'd Phila.	2.59c.
No. 10 gage, f.o.b. dock cars Pacific	3.00c.

Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Gary	2.85c.
No. 20 gage, del'd Phila.	3.04c.
No. 20 gage, f.o.b. dock cars Pacific	4.45c.

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Gary	2.95c.
No. 24, del'd Phila.	3.14c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, f.o.b. dock cars Pacific	3.55c.
No. 24 Wrought iron, Pittsburgh	4.95c.

Long Ternes	
No. 24, unassorted 8-lb. coating	3.25c.
No. 20, f.o.b. Pittsburgh	2.90c.

Vitreous Enameling Stock	
No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Gary	2.75c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Gary	2.75c.

Tin Plate	Base per Box
Standard cokes, f.o.b. P'gh district	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. car dock	
Pacific ports	5.90

Terne Plate	(F.o.b. Pittsburgh)
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.	Base per Lb.
All widths up to 24 in., P'gh	1.75c.
All widths up to 24 in., Chicago	1.85c.
Cooperage stock, Pittsburgh	1.85c.
Cooperage stock, Chicago	1.95c.

Cold-Rolled Strips	
F.o.b. Pittsburgh	2.40c.
F.o.b. Cleveland	2.40c.
Del'd Chicago	2.68c.
F.o.b. Worcester	2.60c.

Fender Stock	
No. 20, Pittsburgh or Cleveland	3.10c.

WIRE PRODUCTS	
(Carload lots, f.o.b. Pittsburgh and Cleve- land.)	
To Manufacturing Trade	Per Lb.
Bright wire	2.20c.
Spring wire	3.20c.

Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments.

Base per Keo	
Standard wire nails	\$2.35
Smooth coated nails	2.35
Galvanized nails	3.85
Base per 100 Lb.	
Smooth annealed wire	\$2.35
Smooth galvanized wire	2.80
Polished staples	3.05
Galvanized staples	3.30
Barbed wire, galvanized	2.85
Woven wire fence, base column	60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

## STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh  
District and Lorain, Ohio, Mills

Butt Weld	
Inches	Steel
1/4	51 1/2
3/8	57 1/2
1/2	62 1/2
3/4	67 1/2
1	72 1/2
1 1/4	77 1/2
1 1/2	82 1/2
2	87 1/2
2 1/2	92 1/2
3	97 1/2
3 1/2	102 1/2
4	107 1/2
4 1/2	112 1/2
5	117 1/2
5 1/2	122 1/2
6	127 1/2
6 1/2	132 1/2
7	137 1/2
7 1/2	142 1/2
8	147 1/2
8 1/2	152 1/2
9	157 1/2
9 1/2	162 1/2
10	167 1/2
10 1/2	172 1/2
11	177 1/2
11 1/2	182 1/2
12	187 1/2
12 1/2	192 1/2
13	197 1/2
13 1/2	202 1/2
14	207 1/2
14 1/2	212 1/2
15	217 1/2
15 1/2	222 1/2
16	227 1/2
16 1/2	232 1/2
17	237 1/2
17 1/2	242 1/2
18	247 1/2
18 1/2	252 1/2
19	257 1/2
19 1/2	262 1/2
20	267 1/2
20 1/2	272 1/2
21	277 1/2
21 1/2	282 1/2
22	287 1/2
22 1/2	292 1/2
23	297 1/2
23 1/2	302 1/2
24	307 1/2
24 1/2	312 1/2
25	317 1/2
25 1/2	322 1/2
26	327 1/2
26 1/2	332 1/2
27	337 1/2
27 1/2	342 1/2
28	347 1/2
28 1/2	352 1/2
29	357 1/2
29 1/2	362 1/2
30	367 1/2
30 1/2	372 1/2
31	377 1/2
31 1/2	382 1/2
32	387 1/2
32 1/2	392 1/2
33	397 1/2
33 1/2	402 1/2
34	407 1/2
34 1/2	412 1/2
35	417 1/2
35 1/2	422 1/2
36	427 1/2
36 1/2	432 1/2
37	437 1/2
37 1/2	442 1/2
38	447 1/2
38 1/2	452 1/2
39	457 1/2
39 1/2	462 1/2
40	467 1/2
40 1/2	472 1/2
41	477 1/2
41 1/2	482 1/2
42	487 1/2
42 1/2	492 1/2
43	497 1/2
43 1/2	502 1/2
44	507 1/2
44 1/2	512 1/2
45	517 1/2
45 1/2	522 1/2
46	527 1/2
46 1/2	532 1/2
47	537 1/2
47 1/2	542 1/2
48	547 1/2
48 1/2	552 1/2
49	557 1/2
49 1/2	562 1/2
50	567 1/2
50 1/2	572 1/2
51	577 1/2
51 1/2	582 1/2
52	587 1/2
52 1/2	592 1/2
53	597 1/2
53 1/2	602 1/2
54	607 1/2
54 1/2	612 1/2
55	617 1/2
55 1/2	622 1/2
56	627 1/2
56 1/2	632 1/2
57	637 1/2
57 1/2	642 1/2
58	647 1/2
58 1/2	652 1/2
59	657 1/2
59 1/2	662 1/2
60	667 1/2
60 1/2	672 1/2
61	677 1/2
61 1/2	682 1/2
62	687 1/2
62 1/2	692 1/2
63	697 1/2
63 1/2	702 1/2
64	707 1/2
64 1/2	712 1/2
65	717 1/2
65 1/2	722 1/2
66	727 1/2
66 1/2	732 1/2
67	737 1/2
67 1/2	742 1/2
68	747 1/2
68 1/2	752 1/2
69	757 1/2
69 1/2	762 1/2
70	767 1/2
70 1/2	772 1/2
71	777 1/2
71 1/2	782 1/2
72	787 1/2
72 1/2	792 1/2
73	797 1/2
73 1/2	802 1/2
74	807 1/2
74 1/2	812 1/2
75	817 1/2
75 1/2	822 1/2
76	827 1/2
76 1/2	832 1/2
77	837 1/2
77 1/2	842 1/2
78	847 1/2
78 1/2	852 1/2
79	857 1/2
79 1/2	862 1/2
80	867 1/2
80 1/2	872 1/2
81	877 1/2
81 1/2	882 1/2
82	887 1/2
82 1/2	892 1/2
83	897 1/2
83 1/2	902 1/2
84	907 1/2
84 1/2	912 1/2
85	917 1/2
85 1/2	922 1/2
86	927 1/2
86 1/2	932 1/2
87	937 1/2
87 1/2	942 1/2
88	947 1/2
88 1/2	952 1/2
89	957 1/2
89 1/2	962 1/2
90	967 1/2
90 1/2	972 1/2
91	977 1/2
91 1/2	982 1/2
92	987 1/2
92 1/2	992 1/2
93	997 1/2
93 1/2	1002 1/2
94	1007 1/2
94 1/2	1012 1/2
95	1017 1/2
95 1/2	1022 1/2
96	1027 1/2
96 1/2	1032 1/2
97	1037 1/2
97 1/2	1042 1/2
98	1047 1/2
98 1/2	1052 1/2
99	1057 1/2
99 1/2	1062 1/2
100	1067 1/2
100 1/2	1072 1/2
101	1077 1/2
101 1/2	1082 1/2
102	1087 1/2
102 1/2	1092 1/2
103	1097 1/2
103 1/2	1102 1/2
104	1107 1/2
104 1/2	1112 1/2
105	1117 1/2
105 1/2	1122 1/2
106	1127 1/2
106 1/2	1132 1/2
107	1137 1/2
107 1/2	1142 1/2
108	1147 1/2
108 1/2	1152 1/2
109	1157 1/2
109 1/2	1162 1/2
110	1167 1/2
110 1/2	1172 1/2
111	1177 1/2
111 1/2	1182 1/2
112	1187 1/2
112 1/2	1192 1/2
113	1197 1/2
113 1/2	1202 1/2
114	1207 1/2</

### Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	36.00
Chicago	37.00
Birmingham	39.00
Youngstown (del'd)	37.00

### ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem. Base price, \$49 a gross ton except at Bethlehem, where it is \$51.

### CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago. Uncropped, \$28 per gross ton.

### COKE, COAL AND FUEL OIL

#### Coke

	Per Net Ton
Furnace, f.o.b. Connellsville	\$3.75
Prompt	
Foundry, f.o.b. Connellsville	\$4.25 to 5.25
Prompt	
Foundry, by-product, Chicago	8.50
ovens, for delivery outside switching district	
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	10.50
Foundry, by-product, Newark or Jersey City, del'd.	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland delivered	9.27
Foundry, Birmingham	4.75
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

#### Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.55 to \$1.80
Mine run coking coal f.o.b. W. Pa. mines	1.80 to 2.00
Gas coal, 4-in., f.o.b. Pa. mines	2.00 to 2.30
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.20
Steam slack, f.o.b. W. Pa. mines	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines	1.65 to 1.85

#### Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
	Per Gal. del'd Chicago
No. 3 industrial fuel oil	3.73c.
No. 5 industrial fuel oil	3.23c.
	Per Gal. f.o.b. Cleveland
No. 3 distillate	5.75c.
No. 4 industrial	5.50c.

### REFRACTORIES

#### Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat	Intermediate
Duty Brick	Duty Brick
Pennsylvania	\$45.00
Maryland	45.00
New Jersey	45.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

#### Chrome Brick

	Per Net Ton
Standard size	\$45.00

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

### CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$44.00 to \$45.00
4-in. del'd Chicago	47.00 to 48.00
4-in. and larger, del'd New York	43.00
4-in. del'd New York	46.00
6-in. and larger, Birmingham	36.00 to 37.00
4-in. Birmingham	39.00 to 40.00
Class "A" and gas pipe, \$3 extra.	

## Pig Iron, Ores, Ferroalloys

### PIG IRON

#### PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.50	\$19.00	\$18.00	\$19.50
Bethlehem, Pa.	18.50	19.00	18.00	19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	19.00	18.00	19.50
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.50
Duluth, Minn.	18.00	18.00	17.00	18.50
Birmingham	13.50	12.50	12.50	13.50
Provo, Utah	16.50	16.50	16.50	16.50

#### DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$19.00	\$19.50	\$18.50	\$20.00
From Buffalo	19.00	19.50	18.50	20.00
Brooklyn				
From East. Pa. or Buffalo	20.77	21.27	20.27	21.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	19.89	20.39	19.39	20.89
Philadelphia				
From Eastern Pa.	19.26	19.76	18.76	20.26
Cincinnati				
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio				
From Cleveland and Youngstown	18.76	18.76	18.76	18.76
Columbus, Ohio				
From Hamilton, Ohio	19.50	19.50	19.50	19.50
Mansfield, Ohio				
From Cleveland and Toledo	19.26	19.26	19.26	19.26
Indianapolis				
From Hamilton, Ohio	19.77	19.77	19.77	19.77
South Bend, Ind.				
From Chicago	19.55	19.55	19.55	19.55
Milwaukee				
From Chicago	18.50	18.50	18.50	18.50
St. Paul				
From Duluth	19.44	19.44	19.44	19.44
Davenport, Iowa				
From Chicago	19.26	19.26	19.26	19.26
Kansas City				
From Granite City	20.04	20.54	20.54	20.54

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

### LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa. and Standish, N. Y.	Del'd Chicago
Johnson City, Tenn.	\$23.00
Del'd Chicago	28.65

### GRAY FORGE PIG IRON

Valley furnace	\$17.50
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### CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.73

### CANADA

#### Pig Iron

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

### Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard, (carload)	\$82.00
Domestic, 80%, seaboard, (less carloads)	89.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$27.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

### Silvery Iron

	F.o.b. Jackson, Ohio, Furnace
	Per Gross Ton
6%	\$22.25
7%	23.25
8%	24.25
9%	25.25
10%	26.25
11%	27.75
	Per Gross Ton
12%	\$29.25
13%	30.75
14%	32.25
15%	33.75
16%	35.25
17%	36.75

Ferrovanadium, del., per lb. contained Van.	\$2.60 to \$2.80
Ferrocobaltitum, 15 to 18% per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn. base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

### Ores

#### Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Meabi Bessemer, 51.50% iron	4.65
Meabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

#### Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c.
Iron, low phos., Swedish, average 68% iron	8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, average, 65% iron (nom.)	8c.
Manganese, Caucasian, washed 52%	22c.
Manganese, African, Indian, 44-48%	20c.
Manganese, African, Indian, 49-51%	21c.
Manganese, Brazilian, 46 to 48%	17c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid	\$12.00
Tungsten, domestic scheelite	\$11.00 to \$12.00

	Per Gross Ton
Chrome, 45%, Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic Seaboard	16.00
Chrome, 48%, Cr <sub>2</sub> O <sub>3</sub> , c.i.f. Atlantic Seaboard	18.00

\*Quotations nominal in absence of sales.

### Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	\$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	16.00
Foreign, 80% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	18.50
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

## Iron and Steel Scrap

### PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.25 to \$11.75
No. 2 heavy melting steel	10.25 to 10.75
No. 2 railroad wrought	11.25 to 11.75
Scrap rails	11.25 to 11.75
Rails 3 ft. and under	14.00 to 14.50
Sheet car crops, ordinary	13.00 to 13.50
Compressed sheet steel	11.25 to 11.75
Hand bundled sheet steel	10.25 to 10.75
Hvy. steel axle turnings	10.25 to 10.75
Machine shop turnings	7.50 to 8.00
Short shov. steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Cast iron carwheels	11.00 to 11.50
Heavy breakable cast	10.25 to 10.75
No. 1 cast	11.00 to 11.50
Rail. knuckles and couplers	13.25 to 13.75
Rail. coil and leaf springs	13.25 to 13.75
Roller steel wheels	13.25 to 13.75
Low phos. billet crops	13.00 to 13.50
Low phos. sheet bar crops	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.50 to 15.00
Steel car axles	13.50 to 14.50

### CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$8.25 to \$8.75
Shoveling steel	8.00 to 8.50

Hydraulic comp. sheets	\$7.00 to \$7.50
Drop force flashings	6.50 to 7.00
No. 1 bushing	7.00 to 7.50
Roller carwheels	8.50 to 9.00
Railroad tires	10.50 to 11.00
Railroad leaf springs	8.50 to 9.00
Axle turnings	7.50 to 8.00
Steel couplers and knuckles	8.50 to 9.00
Coil springs	10.50 to 11.00
Axle turnings (elec. fur.)	7.50 to 8.00
Low phos. punchings	10.50 to 11.00
Low phos. plates, 12 in. and under	10.50 to 11.00
Cast iron borings	5.25 to 5.75
Short shoveling turnings	5.25 to 5.75
Machine shop turnings	5.00 to 5.50
Revolving rails	9.50 to 10.00
Steel rails, less than 3 ft.	10.00 to 10.50
Steel rails, less than 2 ft.	10.50 to 11.00
Angle bars, steel	9.00 to 9.50
Cast iron carwheels	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	7.50 to 8.00

	Per Net Ton
Iron car axles	\$11.00 to \$11.50
Steel car axles	9.50 to 10.00
No. 1 railroad wrought	7.25 to 7.75
No. 2 railroad wrought	7.25 to 7.75

No. 2 busheling	\$3.50 to \$4.00
Locomotive tires, smooth	8.50 to 9.00
Pipe and flues	4.25 to 4.75
No. 1 machinery cast	8.50 to 9.00
Clean automobile cast	8.00 to 8.50
No. 1 railroad cast	7.50 to 8.00
No. 1 agricultural cast	7.00 to 7.50
Stove plate	6.00 to 6.50
Grate bars	6.00 to 6.50
Brake shoes	7.50 to 8.00

#### PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.00
No. 2 heavy melting steel	8.00 to 8.50
No. 1 railroad wrought	11.00
Bundled sheets	8.00 to 8.50
Hydraulic compressed, new	9.50 to 10.00
Hydraulic compressed, old	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
Heavy axle turnings	9.00
Cast borings	5.00 to 5.50
Heavy breakable cast	10.00
Stove plate (steel works)	8.00
No. 1 low phos. heavy	13.00 to 14.00
Couplers and knuckles	12.00 to 12.50
Roller steel wheels	12.00 to 12.50
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.50 to 9.00
Shafting	14.00 to 14.50
Steel axles	11.50 to 12.00
No. 1 forge	8.00 to 8.50
Cast iron car wheels	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	11.00 to 11.50

#### CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting steel	8.50 to 9.00
Compressed sheet steel	8.50 to 9.00
Light bundled sheet stampings	6.50 to 7.00
Drop forge flashings	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Steel axle turnings	7.50 to 8.00
Low phos. billet crops	12.50 to 13.00
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
No. 1 cast	11.00 to 11.50
Railroad grate bars	6.50 to 7.00
Stove plate	7.50 to 8.00
Halls under 3 ft.	10.00 to 10.50
Rails for rolling	10.50 to 11.00
Railroad malleable	10.00 to 10.50
Cast iron carwheels	11.00

#### BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$9.00 to \$9.50
No. 2 heavy melting steel	8.00 to 8.50
Scrap rails	8.50 to 9.00
New hydraulic comp. sheets	10.00 to 10.50
Old hydraulic comp. sheets	6.00 to 6.50
Drop forge flashings	8.00 to 8.50
No. 1 busheling	8.00 to 8.50
Hvy. steel axle turnings	8.50 to 9.00
Machine shop turnings	6.00 to 6.50
Knuckles and couplers	11.00 to 11.50
Coil and leaf springs	11.00 to 11.50
Roller steel wheels	11.00 to 11.50
Low phos. billet crops	12.50 to 13.00
Short shov. steel turnings	7.00 to 7.50
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 2 busheling	11.00 to 11.50
Steel car axles	11.00 to 12.00
Iron axles	11.00 to 12.00
No. 1 machinery cast	10.50 to 11.00
No. 1 cupola cast	10.00 to 10.50
Stove plate	8.75 to 9.25
Steel rails, 3 ft. and under	11.50 to 12.00
Cast iron carwheels	10.00 to 10.50
Industrial malleable	10.50 to 11.00
Railroad malleable	10.50 to 11.00
Chemical borings	9.00 to 10.00

#### BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00
Scrap steel rails	9.00
Short shoveling turnings	5.50
Stove plate	7.60 to 7.50
Steel axles	11.00 to 11.50
Iron axles	11.00 to 11.50
No. 1 railroad wrought	7.00
Rails for rolling	10.50
No. 1 cast	9.00 to 9.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

#### ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$9.00 to \$9.50
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.50 to 8.00
No. 1 locomotive tires	8.00 to 8.50
Misc. stand.-sec. rails	9.25 to 9.75
Railroad springs	10.00 to 10.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	8.50 to 9.00
Cast iron borings and shoveling turnings	4.50 to 5.00
Rails for rolling	10.25 to 10.75
Machine shop turnings	4.25 to 4.75
Heavy turnings	5.50 to 6.00
Steel car axles	10.00 to 10.50
Wrot. iron bars and trans.	12.00 to 13.00
No. 1 railroad wrought	6.25 to 6.75
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	11.50 to 12.00
Cast iron carwheels	6.75 to 7.25
No. 1 machinery cast	8.75 to 9.25
Railroad malleable	8.50 to 9.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Relay rails, 60 lb. and under	16.00 to 16.50

Relay rails, 60 lb. and over	\$20.00 to \$21.00
Agricult. malleable	9.00 to 9.50

#### BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.50 to \$6.00
Scrap T rails	5.50 to 6.00
Machine shop turnings	2.50 to 2.75
Cast iron borings	4.00 to 4.25
Bundled skeleton, long	4.75 to 5.00
Forge flashings	4.75 to 5.00
Blast furnace scrap	4.75 to 5.00
Shafting	9.00 to 9.50
Steel car axles	8.50 to 9.00
Wrought pipe	3.50 to 4.00
Rails for rolling	6.00 to 6.50
Cast iron borings, chemical	7.50 to 8.00
Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.50
No. 1 machinery cast	10.00 to 10.50
Stove plate	6.25 to 6.50
Railroad malleable	11.00 to 12.00

#### NEW YORK

Dealers' buying prices per gross ton:	
Prices in italics for loading on barge; all others for loading on cars.	
No. 1 heavy melting steel	\$6.50 to \$7.50
No. 2 heavy melting steel	5.50 to 6.50
Heavy breakable cast	6.00 to 6.25
No. 1 machinery cast	6.50 to 7.00
No. 2 cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Steel car axles	10.00 to 10.50
No. 1 railroad wrought	7.50 to 8.00

No. 1 yard wrought, long	\$6.50 to \$7.00
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	8.00 to 8.50
Short shoveling turnings	3.00 to 3.50
Machine shop turnings	2.50 to 3.00
Cast borings	4.50 to 4.75
No. 1 blast furnace	2.50 to 3.00
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	2.50 to 3.00
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$8.00
No. 1 hvy. cast (cupola size)	7.75
No. 2 cast	7.00

#### CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$7.75 to \$8.50
Scrap rails for melting	8.50 to 9.00
Loose sheet clippings	4.75 to 5.25
Bundled sheets	5.75 to 6.25
Cast iron borings	5.75 to 6.25
Machine shop turnings	5.25 to 5.75
No. 1 busheling	6.00 to 6.50
No. 2 busheling	3.00 to 3.50
Rails for rolling	9.00 to 9.50
No. 1 locomotive tires	8.50 to 9.00
Short rails	11.25 to 11.75
Cast iron carwheels	7.75 to 8.25
No. 1 machinery cast	9.00 to 9.50
No. 1 railroad cast	8.50 to 9.00
Burnt cast	6.00 to 6.50
Stove plate	6.00 to 6.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	8.50 to 9.00

#### DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$6.75 to \$7.35
Borings and short turnings	5.75 to 6.35
Long turnings	5.25 to 5.75
No. 1 machinery cast	7.50 to 8.00
Automotive cast	9.50 to 10.00
Hydraulic comp. sheets	6.75 to 7.35
Stove plate	5.75 to 6.35
New factory busheling	5.75 to 6.35
Old No. 2 busheling	4.50 to 5.00
Sheet clippings	4.50 to 5.00
Flashings	5.50 to 6.00
Low phos. plate scrap	7.50 to 8.00

#### CANADA

Dealers' buying prices per gross ton:	
	Toronto Montreal
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axles	4.50 6.00
Axles, wrought iron	4.50 6.50
No. 1 machinery cast	7.75 9.00
Stove plate	4.50 5.00
Standard carwheels	7.25 7.90
Malleable	6.75 7.90

## Warehouse Prices for Steel Products

#### PITTSBURGH

Base per Lb.	
Plates	3.05c
Structural shapes	2.85c
Soft steel bars and small shapes	2.85c
Reinforcing steel bars	3.00c
Cold-finished and screw stock—	
Rounds and hexagons	3.20c
Squares and flats	3.20c
Hoops and bands, under 1/2 in.	3.10c
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c
Galv. sheets (No. 24), 25 or more bundles	3.70c
Hot-rolled sheets (No. 10)	2.85c
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.32
Spikes, large	2.90c
Small	2.65c
Boat	2.90c
Track bolts, all sizes, per 100 count	65 per cent off list.
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	70 per cent off list.
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'd, base per 100 lb.	2.90
Wire, galv. soft, base per 100 lb.	2.35
Common wire nails, per keg	2.65
Cement coated nails, per keg	2.65

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.	
CHICAGO	
Base per Lb.	
Plates and structural shapes	3.10c
Soft steel bars	2.90c
Cold-fn. steel bars and shafting	3.25c
Rounds and hexagons	3.25c
Flats and squares	3.25c
Bands 3/16 in. (in Nos. 10 and 12 gages)	3.20c
Hoops (No. 14 gage and lighter)	3.20c
Hot-rolled annealed sheets (No. 24) 3.70c	
Galv. sheets (No. 24)	4.30c
Hot-rolled sheets (No. 10)	2.85c
Spikes (3/16 in. and lighter)	3.50c
Track bolts	4.65c
Rivets, structural (keg lots)	3c
Rivets, boiler (keg lots)	3.10c
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq., tap, or blank	60 and 5
Hot-pressed nuts, hex., tap, or blank	60 and 5
Hex. head and cap screws	85 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotter pins	60 and 10
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.75
Com. wire nails, base per keg	2.70c
Cement c'd nails, base per keg	2.70c

#### CHICAGO

Base per Lb.	
Plates and structural shapes	3.10c
Soft steel bars	2.90c
Cold-fn. steel bars and shafting	3.25c
Rounds and hexagons	3.25c
Flats and squares	3.25c
Bands 3/16 in. (in Nos. 10 and 12 gages)	3.20c
Hoops (No. 14 gage and lighter)	3.20c
Hot-rolled annealed sheets (No. 24) 3.70c	
Galv. sheets (No. 24)	4.30c
Hot-rolled sheets (No. 10)	2.85c
Spikes (3/16 in. and lighter)	3.50c
Track bolts	4.65c
Rivets, structural (keg lots)	3c
Rivets, boiler (keg lots)	3.10c
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq., tap, or blank	60 and 5
Hot-pressed nuts, hex., tap, or blank	60 and 5
Hex. head and cap screws	85 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotter pins	60 and 10
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.75
Com. wire nails, base per keg	2.70c
Cement c'd nails, base per keg	2.70c

#### NEW YORK

Base per Lb.	
Plates	3.30c
Structural shapes	3.27c
Soft steel bars, small shapes	3.17c
Iron bars	3.24c
Iron bars, swed. charcoal	7.00c
Cold-fn. shafting and screw stock	3.79c
Rounds and hexagons	4.29c
Flat head strip, soft and quarter hard	4.00c
Hoops	3.42c
Bands	3.42c
Hot-rolled sheets (No. 10)	3.17c
Hot-rolled ann'd sheets (No. 24)	3.65c
Galvanized sheets (No. 24)	4.25c
Long term sheets (No. 24)	4.75c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.30c
Wire, galv. annealed (No. 10)	4.05c

Tire steel 1/2 x 1/4 in. and larger	3.40c
Smooth finish 1 to 2 1/4 x 1/4 in. and larger	3.75c
Open larger spring steel, bases	3.75c to 10.00c
Common wire nails, base, per keg \$3.00	
Machine bolt, cut thread: Off List	
1/2 x 6 in. and smaller	60
1 x 30 in. and smaller	60
Carriage bolts, cut thread: 60	
1/2 x 6 in. and smaller	60
3/4 x 20 in. and smaller	50
Boiler tubes: Per 100 Ft.	
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65
*No. 28 and lighter, 36 in. wide, 20c higher per 100 lb.	

#### ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.34c
Bars, soft steel or iron	3.14c
Cold-fn. rounds, shafting, screw stock	3.59c
Hot-rolled annealed sheets (No. 24) 3.94c	
Galv. sheets (No. 24)	4.54c
Hot-rolled sheets (No. 10)	3.19c
Black corrug. sheets (No. 24)	3.90c
Galv. corrug. sheets	4.59c
Structural rivets	3.59c
Boiler rivets	3.69c
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	60
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, glow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	60
1000 lb. or over	55 and 5
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50

#### PHILADELPHIA

Base per Lb.	
*Plates, 1/2-in. and heavier	2.75c
*Structural shapes	2.75c
*Soft steel bars, small shapes, iron bars (except bands)	2.75c
*Reinforce steel bars, sq., twisted and deformed	2.50c
Cold-finished steel bars	3.58c
*Steel hoops	3.30c
*Steel bands, No. 12 to 3/16 in., incl.	3.05c
Spring steel	5.00c
*Hot-rolled annealed sheets (No. 24) 3.40c	
*Galvanized sheets (No. 24)	4.00c
*Hot-rolled annealed sheets (No. 10)	2.95c
Diam. pat. floor plates, 1/2 in.	4.75c
Swedish iron bars	6.25c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.  
 \*Base prices subject to deduction on orders aggregating 4000 lb. or over.

## Fabricated Structural Steel

**B**OOKINGS of 22,300 tons of structural steel compare with 12,550 tons last week and 9000 tons two weeks ago. The bulk of awards again was for public work, the largest, 13,000 tons, being for the towers of the Triboro bridge, New York; 2700 tons was placed for hangars at Hamilton Field, Cal., and 1135 tons for Lock No. 21 on the Mississippi River at Quincy, Ill. New projects of 16,800 tons compare with 9800 tons in the previous week. Awards for the week follow:

### NORTH ATLANTIC

Woolwich, Me., 230 tons, State highway bridge, to Pittsburgh-Des Moines Steel Co.

New York, 13,000 tons, two towers for Triboro bridge; bulk of tonnage sublet to American Locomotive Co. by Taylor-Fichter Steel Construction Co., general contractor.

New York, 300 tons, cranes for Navy Yard, to Orton Crane & Shovel Co., Chicago.

Saratoga Springs, N. Y., 110 tons, arcade building, to Ingalls Iron Works.

Kearny's Point, N. J., 200 tons, building for E. I. du Pont de Nemours & Co., to McClintic-Marshall Corp.

Reading, Pa., 345 tons, addition to Wilhelm Paint Co. building, to Reading Steel Products Co.

### SOUTH AND SOUTHWEST

Waynesboro, N. C., 285 tons, highway bridge over Pee Dee River, to Carolina Steel & Iron Co.

Greenville, Miss., 560 tons, wharf boat, to Ingalls Iron Works.

Carville, La., 140 tons, Lepers' Home, to Chester Iron & Foundry Co., St. Louis.

Russellville, Ark., 150 tons, bridge, to Virginia Bridge & Iron Co.

Albuquerque, N. M., 135 tons, radial gates, to Kansas City Structural Steel Co.

### CENTRAL STATES

Canton, Ohio, 125 tons, Timken Roller Bearing Co. crane runway, to Canton Structural Steel Co.

Quincy, Ill., 1135 tons, Lock No. 21, to Mississippi Valley Structural Steel Co.

Springfield, Ill., 740 tons, municipal power plant, to Duffin Iron Works.

State of Minnesota, 240 tons, bridges, to Minneapolis-Moline Power Implement Co.

State of Nebraska, 850 tons, highway bridges, to Omaha Steel Works.

Overton, Neb., 100 tons, bridge, to St. Joseph Structural Steel Co.

### WESTERN STATES

Hamilton Field, Cal., 2700 tons, airplane hangars, to Consolidated Steel Corp., Ltd.

San Francisco, 400 tons, brewery addition, to Herrick Iron Works.

McConnel, Cal., 220 tons, subway for Southern Pacific, to McClintic-Marshall Corp.

Dillard, Ore., 385 tons, State highway bridge, to Pittsburgh-Des Moines Steel Co.

### HAWAII

Pearl Harbor, 350 tons, extensions to foundry building, to Virginia Bridge & Iron Co.

### NEW STRUCTURAL STEEL PROJECTS

#### NORTH ATLANTIC STATES

New York, 6000 tons, mid-town post office annex; new bids to be taken Dec. 27 by Treasury Department; former bids rejected.

Hamden, Conn., 700 tons, high school.

Buffalo, 300 tons, Erie County highway bridges; McClintic-Marshall Corp. low bidder.

Amctelle, Md., 1250 tons, extension to Celanese Corp. building.

#### SOUTH AND SOUTHWEST

Danville, Miss., 100 tons, bridge.

Fort Sill, Okla., 150 tons, officers quarters.

Camden, Ark., 100 tons, bridge.

Snow Lake, Ark., 1050 tons, bridge for Missouri Pacific.

### CENTRAL STATES

Clermont County, Ohio, 125 tons, highway project; contingent upon Federal approval.

St. Clair County, Ill., 100 tons, highway bridge; bids Dec. 16.

Manteno, Ill., 500 tons, State hospital.

Genoa, Wis., 1000 tons, Lock No. 8, Mississippi River; Jutton-Kelly Co., Milwaukee, low bidder on general contract.

Prairie du Chien, Wis., 150 tons, State highway bridge; bids close Dec. 12.

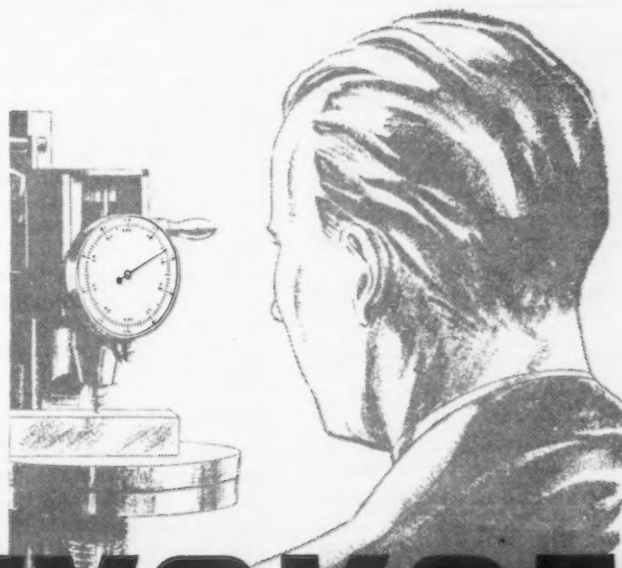
Lynxville, Wis., 1000 tons, dam and locks across Mississippi River.

Winona, Minn., 1200 tons, structural steel and plates; also 2500 tons of sheet piling, Lock No. 5A, Mississippi River, United States Engineer Office, St. Paul.

Saverton, Mo., 1200 tons, Lock No. 22, Mississippi River, United States Engineer Office, St. Louis.

Lafayette County, Mo., 115 tons, highway bridge; bids Dec. 8.

Rulo, Neb., 1300 tons, bridge; Kansas City Bridge Co., low bidder on general contract.



# WYCKOFF

## COLD DRAWN STEELS

*products of unceasing vigilance  
... always—*

Metallurgically trained men backed by modern scientific testing and inspecting facilities supervise every step in the manufacture of Wyckoff Cold Drawn Steels,—you constant assurance of those qualities of fitness and uniformity in your finished product so essential to the maintenance of present day production standards.

The facilities of both our metallurgical and mechanical departments are always available to users in solving special machining difficulties or other similar problems.

We will welcome an opportunity to serve you.

## WYCKOFF COLD DRAWN STEEL COMPANY

GENERAL OFFICES—Ambridge, Penna.

MILLS—Ambridge, Penna. and Chicago, Ill.

Omaha, Neb., 4000 tons, bridge across Missouri River; bids Dec. 12.

#### WESTERN STATES

Mare Island, Cal., 1600 tons, causeway.

Santa Rosa, Cal., 380 tons, County bridge over Russian River; bids Dec. 8.

Oakland, Cal., 1450 tons, County bridge at Park Street; bids to be taken soon.

#### HAWAII

Pearl Harbor, 900 tons additional, facilities building, Ralph E. Woolley, low bidder on general contract.

#### FABRICATED PLATE

##### AWARDS

Tiverton, R. I., 1050 tons, tanks for New England Terminal Co., to Chicago Bridge & Iron Works.

Tampico, Mexico, 1475 tons, tanks for Pierce Oil Co., to McClintic-Marshall Corp.

## Reinforcing Steel

Awards 7600 Tons—New Projects  
2350 Tons

##### AWARDS

Westchester County, N. Y., 200 tons, road mesh, to Concrete Steel Co.

Atlantic County, N. J., 200 tons, road mesh, to Kalman Steel Corp.

Ravenswood, W. Va., 100 tons, State highway bridge, to Truscon Steel Co.; Boso & Ritchey, general contractors.

Trempealeau, Wis., 300 tons, dam across Mississippi River, to Kalman Steel Co.

Springfield, Ill., 315 tons, municipal power plant, to Laclede Steel Co.

Pearl Harbor, T. H., 6000 tons, pier and quay walls, to Pacific Coast Steel Corp.

Honolulu, T. H., 270 tons, reservoir on Diamond Head, to an unnamed bidder.

State of Colorado, 180 tons, highway structures in three counties, to unnamed bidders.

#### NEW REINFORCING BAR PROJECTS

Northampton, Mass., 100 tons, hospital ward building and dining hall.

Westboro, Mass., 100 tons, hospital kitchen and laundry.

Manteno, Ill., 700 tons, hospital buildings.

Santa Rosa, Cal., 100 tons, County bridge over Russian River; bids Dec. 8.

Oakland, Cal., 550 tons, County bridge at Park Street; bids to be taken soon.

Los Angeles, 230 tons, State paving; bids Dec. 20.

Riverside, Cal., 150 tons, Woodcraft Home addition; general contract awarded.

Pearl Harbor, T. H., 400 tons, facilities building; Ralph E. Woolley, low bidder on general contract.

## Railroad Equipment

Kansas City Southern is building 100 box cars in its shops at Pittsburg, Kan.

Carbide & Carbon Chemical Corp. has ordered four aluminum tank cars from General American Transportation Corp.

General American Transportation Corp. will build 10 tank cars for Mathieson Alkali Works.

United Fruit Co. has ordered 20 flat cars for export from Pullman Standard Car Export Corp.

United States Navy has ordered 20 flat cars, seven box, four gondola and two hopper cars from Haffner-Thrall Car Co., Chicago.

Board of District Commissioners, District Building, Washington, asks bids until Dec. 15 for 150,000 ft. of 33-ft. rails; one two-piston type mud jack, mounted on trailer.

## St. Louis Road to Buy 25,000 Tons of Rails

ST. LOUIS, Dec. 5.—Trustees of the Missouri Pacific Railway have been authorized by Federal Judge Faris to buy 25,000 tons of steel rails, with tie plates, rail anchors, frogs, switches, angle bars, etc., for 1934 at a cost of \$1,725,120. The trustees stated that during the years 1925 to 1933 the purchases of steel rails for the Missouri Pacific and subsidiaries averaged 43,821 tons a year. The court also authorized the trustees to install 244 loading devices on automobile box cars at a cost of \$105,650.

The Chester Iron & Foundry Co. has been awarded 140 tons of structural steel for a lepers' home at Carrville, La. Laclede Steel Co. has been awarded 315 tons of reinforcing bars for a municipal power plant at Springfield, Ill. There has been a slight gain in the movement of wire products; other finished steel items are quiet.

#### Pig Iron

First quarter prices on pig iron are the same as for fourth quarter. No buying movement has yet got under way, but demand is expected to pick up materially after Jan. 1.

#### Scrap

The American Steel Foundries Co. came into the market again this week, buying melting steel and bringing their total purchases of scrap for the last two weeks up to approximately 10,000 tons, to be delivered over the next week. Some short interest has been created by this purchase, and dealers are paying higher prices. Other steel companies in the district are said to be inquiring for material. Heavy melting steel, No. 2 railroad wrought, and steel rails less than 3 ft. in length are 50c. a ton higher. The Mobile & Ohio has issued a list of 35 carloads of scrap iron.

## Export Demand for Scrap at Boston

BOSTON, Dec. 5.—A barge is being loaded here with 1000 tons of No. 2 steel scrap for export. To what European port the scrap is destined has not been disclosed. Instructions are to send the barge to New York, where the scrap is to be reloaded on a steamer. The scrap market otherwise continues very quiet, with prices in most cases nominal.

The expected gain in pig iron buying has not developed. The market in the past week continued quiet, with bookings aggregating but a few hundred tons. Some sales of carlots were made for early January delivery at the new schedule of prices, but most purchases were for immediate or

nearby delivery. Furnace representatives now feel buying will not improve until after Dec. 15, if then. The New England melt is still at a very low rate, with no indications of early improvement. Large melters have a comfortable supply of iron on hand, but the rank and file have comparatively little.

The New England chapter of the American Steel Warehouse Association has adopted a standard schedule for cold-saw cutting, effective Dec. 1, last. It is applicable to all grades of hot-rolled steel, forgings, cold-finished steel and alloy steels.

## Philadelphia Steel Club Elects Officers

THE Philadelphia Steel Club has elected the following officers for 1934: F. L. Stephenson, Bethlehem Steel Co., president; L. B. Jackson, Wickwire-Spencer Steel Co., vice-president, and A. C. Buterbaugh, Sharon Steel Hoop Co., secretary-treasurer. George W. Wilson, Delaware Steel Service Co., and H. E. Richardson, Youngstown Sheet & Tube Co., have been named directors. The new officers and directors are all associated with the Philadelphia district sales offices of their respective companies.

## Torrington Co. Buys Westfield Mfg. Co.

THE sale of the Westfield Mfg. Co., Westfield, Mass., has been ordered by the court to the Torrington Co., Torrington, Conn. The purchaser will pay 37½c. on the dollar on claims aggregating \$843,652. The Chase National Bank of New York is the largest creditor and urged the sale.

## Pipe Lines

Cedar Rapids Gas Co., 327 Third Street, Cedar Rapids, Iowa, plans steel pipe line from point near Iowa City, Iowa, to Cedar Rapids and vicinity, about 50 miles. Cost about \$550,000. Mark Anderson is general manager.

Shamrock Oil & Gas Co., Amarillo, Tex., plans extensions in 16 and 18-in. steel pipe line to plant near Lefors, Gray County field, about 12 miles, for gasoline service.

Houston Natural Gas Co., Petroleum Building, Houston, Tex., plans natural gas steel pipe line from oil fields at Conroe and Tomball, Tex., to point near city.

Holdenville, Okla., plans welded steel pipe line system for natural gas distribution in city limits. Cost about \$100,000. C. H. Edge is city engineer.

Northern States Power Co., 15 South Fifth Street, Minneapolis, Minn., plans steel pipe line for natural gas distribution at Northfield, Minn., where franchise has been asked.

Port Allen, La., plans welded steel pipe line for natural gas trunk service and local distribution system. Bonds for \$60,000 have been authorized. L. J. Voorhies, Baton Rouge, La., is consulting engineer.

Oakland, Cal., plans pipe line for high-pressure system for fire protection. Special election is called for Dec. 19 to vote bonds for \$350,000.

Los Angeles has awarded 290 tons of pipe fabricated from sheets, for Metropolitan Water District, to Southern Pipe & Casing Co.

# October Steel Exports Gain; Imports Decline

Exports of Iron and Steel from the United States  
(In Gross Tons)

	October		Ten Months Ended October	
	1933	1932	1933	1932
Pig iron .....	405	175	2,264	2,093
Ferromanganese .....	6	2	33	28
Scrap .....	81,176	10,004	594,763	168,166
Pig iron, ferroalloys and scrap .....	81,587	10,181	597,060	170,287
Ingots, blooms, billets, sheet bar .....	846	180	2,897	1,589
Skelp .....	3,769	4,224	15,004	21,230
Wire rods .....	2,645	1,123	11,605	13,238
Semi-finished steel .....	7,260	5,527	32,506	36,057
Steel bars .....	2,414	1,040	17,212	12,833
Alloy steel bars .....	196	128	1,220	1,440
Iron bars .....	44	35	441	563
Plates, iron and steel .....	2,619	710	9,824	9,378
Sheets, galvanized steel .....	9,228	3,904	42,486	22,593
Sheets, galvanized iron .....	245	105	907	1,203
Sheets, black steel .....	5,792	2,083	28,059	33,042
Sheets, black iron .....	461	135	2,027	2,258
Hoops, bands, strip steel .....	1,424	1,161	16,407	15,610
Tin plate; terne plate .....	15,448	3,659	60,620	33,210
Structural shapes, plain material .....	2,393	704	12,157	13,234
Structural material, fabricated .....	1,919	1,135	12,394	14,094
Tanks, steel .....	337	199	2,170	2,091
Steel rails .....	7,401	355	25,306	10,483
Rail fastenings, switches, frogs, etc. ....	2,409	177	5,968	3,349
Boiler tubes .....	276	289	3,287	2,931
Casing and oil-line pipe .....	8,363	1,317	30,377	16,025
Pipe, black and galvanized, welded steel ..	4,020	2,413	26,960	23,126
Pipe, black and galvanized, welded iron ..	154	83	1,185	3,226
Plain wire .....	3,420	571	15,724	7,256
Barbed wire and woven wire fencing .....	2,661	1,500	23,187	15,580
Wire cloth and screening .....	74	53	588	541
Wire rope .....	258	198	1,611	1,345
Wire nails .....	832	365	8,152	6,140
Other nails and tacks .....	330	196	3,299	2,818
Horseshoes .....	6	20	115	80
Bolts, nuts, rivets and washers, except track ..	560	199	2,888	2,201
Rolled and finished steel .....	73,281	22,734	354,571	256,650
Cast iron pipe and fittings .....	779	1,268	9,854	7,654
Malleable iron screwed fittings .....	453	132	2,044	1,422
Car wheels and axles .....	240	295	3,253	2,384
Iron castings .....	255	650	2,669	2,463
Steel castings .....	59	44	661	1,062
Forgings .....	331	233	2,579	3,293
Castings and forgings .....	2,117	2,622	21,060	18,278
All other .....	507	157	3,310	3,220
Total .....	164,755	41,221	1,008,507	484,492

Imports of Iron and Steel Products into the United States  
(In Gross Tons)

	October		Ten Months Ended October	
	1933	1932	1933	1932
Pig iron .....	19,621	17,286	139,020	107,610
Sponge iron .....	102	51	619	158
Ferromanganese and spiegeleisen* .....	5,430	1,297	45,426	18,429
Ferrochrome† .....	84	17	24	150
Ferrosilicon† .....	84	4	503	48
Other ferroalloys .....	7,399	136	53,709	9,688
Scrap .....	32,636	18,792	239,403	136,756
Pig iron, ferroalloys and scrap .....	251	29	869	2,215
Steel ingots, blooms, etc. ....	1,735	403	11,420	5,850
Wire rods .....	1,986	432	12,239	8,065
Semi-finished steel .....	85	1,669	2,038	24,798
Concrete reinforcement bars .....	71	34	750	723
Hollow steel bars .....	2,178	2,114	16,736	26,241
Merchant steel bars .....	34	6	346	427
Iron bars .....	...	...	1	11
Iron slabs .....	...	32	191	408
Boiler and other plate .....	638	2,313	7,895	16,875
Sheets, skelp, and saw plate .....	11	10	232	7,225
Tin plate .....	3,481	2,475	24,642	26,724
Structural shapes .....	72	...	166	1
Sheet piling .....	704	119	5,320	5,035
Rails and rail fastenings .....	185	195	3,739	3,663
Welded pipe .....	342	157	1,730	2,263
Other pipe .....	311	949	6,527	12,144
Barbed wire .....	261	150	2,496	1,676
Round iron and steel wire .....	210	77	1,042	1,268
Flat wire and strip steel .....	103	175	1,308	1,510
Wire rope and strand .....	77	109	1,378	846
Other wire .....	2,351	2,904	18,347	27,462
Hoops and bands .....	696	877	5,494	8,624
Nails, tacks, and staples .....	41	41	223	189
Bolts, nuts, and rivets .....	55	31	350	126
Other finished steel .....	11,906	14,437	100,951	168,239
Rolled and finished steel .....	...	...	724	199
Cast iron pipe and fittings .....	145	45	1,134	841
Castings and forgings .....	...	...	...	...
Total .....	46,673	33,706	354,501	314,100

\*Manganese content only.  
†Chromium content only.  
‡Silicon content only.

WASHINGTON, Dec. 4.—Iron and steel exports in October totaled 164,755 tons, as compared with 108,799 tons in the previous month, and 41,221 tons in October, 1932. Iron and steel imports in October, at 46,673 tons, compare with 55,706 tons in the previous month and 33,706 tons in October, 1932.

Scrap exports in October totaled 81,176 tons, as against 40,536 tons in September, and 10,004 tons in October, 1932. Exports of rolled and finished steel were 73,284 tons in October, compared with 57,933 tons in the previous month and 25,826 tons in October, 1932. Tin plate shipments abroad showed a particularly sharp gain, the exports for October totaling 15,448 tons against 7490 tons in September, and 3659 tons in October, 1932.

Total exports for the first 10 months of 1933 were 1,008,507 tons, a gain of 524,015 tons over the same period in 1932. Scrap shipments—594,763 tons in all—made up the greater part of the increase, but other items, notably sheets and tubular products, registered a total gain of 97,418 tons.

Imports for the 10 months show a gain of 40,401 tons over the corresponding period in 1932, the increase being accounted for principally by heavier receipts of scrap, pig iron and ferromanganese.

Japan and Italy ranked first and second in October as destinations of American exports, largely on the strength of scrap shipments.

Sources of American Imports of Iron Ore

	October		Ten Months Ended October	
	1933	1932	1933	1932
Canada .....	45	...	90	807
Cuba .....	...	...	143,150	66,000
Chile .....	129,912	...	356,432	218,492
Spain .....	295	...	901	245
Sweden .....	...	...	...	7,037
French Africa .....	...	...	...	10,000
Russia .....	17,400	8,600	101,490	139,270
Other countries .....	3,666	7,403	60,743	92,345
Total .....	151,318	16,003	662,806	534,196

United States Imports of Pig Iron by Countries of Shipment

	October		Ten Months Ended October	
	1933	1932	1933	1932
United Kingdom .....	255	...	5,395	16,442
British India .....	9,458	1,251	57,653	26,251
Germany .....	...	100	234	325
Netherlands .....	9,294	14,095	58,014	61,248
Canada .....	288	1,815	11,132	2,012
France .....	...	...	...	...
Belgium .....	...	...	...	200
Norway .....	101	...	803	102
Sweden .....	225	25	3,205	447
All others .....	...	...	2,584	583
Total .....	19,621	17,286	139,020	107,610

# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NEW ENGLAND ▶

**Hartford Die & Machine Co.,** Hartford, Conn., has been organized by Lucius F. Robinson, Jr., 750 Main Street, and J. C. Parsons, 27 Ellsworth Street, capital \$500,000, to manufacture tools, dies and machinery.

**Aeronautics Branch,** Department of Commerce, Washington, asks bids until Dec. 11 for new radio range building and antenna system at United States Airway Teletype Station, Municipal Airport, East Boston, including four 125-ft. skeleton steel radio masts, building unit, etc., woven wire and barbed wire fencing (Schedule 293-B).

**Board of Education,** Waltham, Mass., plans manual training department in new multi-story high school. Fund of \$407,000 has been arranged.

**Arthur Rosenstein,** 120 Milk Street, Boston, architect, has plans for new distillery at 560 Harrison Street, for company whose name is temporarily withheld. Cost over \$70,000 with equipment.

**Lincoln Foundry, Inc.,** Boston, has been organized by Herbert V. Evans, 99 Manthorne Road, West Roxbury, Mass., and associates, to manufacture iron and other metal castings.

**Wehle Brewing Co.,** 1093 Campbell Avenue, West Haven, Conn., has let general contract to National Construction Co., 1145 Chapel Street, New Haven, Conn., for one-story addition, 46 x 116 ft. Cost over \$50,000 with equipment. Brown & VonBeren, New Haven, are architects.

**Board of Selectmen,** New Bedford, Mass., plans manual training department in addition to high school at County and Morgan Streets. Cost about \$500,000.

## ◀ NORTH ATLANTIC ▶

**Rubel Ice Corp.,** 937 Fulton Street, Brooklyn, has plans for extensions and improvements in five-story brewery, 75 x 285 ft., at 156th Street and St. Ann's Avenue, New York. Cost over \$500,000 with machinery. Alfred H. Eccles, 29-09 Bridge Plaza, Long Island City, is architect.

**Distillers & Brewers Corp. of America,** 21 West Street, New York, is arranging for purchase of plants of Hammondsport Vintage Corp., and Sterling Distilling Corp., and will operate as new units. Extensions and improvements will be made, including equipment. Company has authorized sale of stock for \$500,000, part of fund to be used for program.

**Texteel Wire Strip Co., Inc.,** Bronx, New York, has been organized by Bernard Waldman, 2149 Eightieth Street, Brooklyn, and Harry Tockman, 733 Allerton Avenue, Bronx, to manufacture wire and steel specialties.

**Prendergast-Davies Co., Ltd.,** New York, Jerome C. Baum, president, recently organized, has leased five-story building at 25 Beekman Street, for new liquor storage and distributing plant.

**Distilled Liquors Corp.,** 265 Greenwich Street, New York, recently organized, is arranging for two new plant units, in addition to two previously announced, at Mount Kisco, N. Y., and Sterling, Mass., where property has been acquired. Buildings will be remodeled and new equipment installed.

**Universal Machine Labeler Co., Inc.,** New York, has been organized by Joseph Ferrara, 1195 MacDonald Avenue, Brooklyn, and Michael Sputanik, P. O. Box 473, Manville, N. J., to manufacture labeling machines, parts and other devices.

**Mavis Bottling Co. of America, Inc.,** 140 Cedar Street, New York, is arranging sale of stock for \$250,000, part of fund to be used for expansion. Company is affiliated with Highland Brewery, Inc., Newburgh, N. Y.

**Eastern Laboratories, Inc.,** 227 East Thirty-eighth Street, New York, manufacturer of electrical appliances and devices, has leased floor in building at 216-26 East Forty-fifth Street for new plant.

**O. Thompson, Inc.,** Long Island City, has been organized by Olof Thompson, 24 North Boulevard, Bay Park, L. I., and associates, to manufacture electric control equipment and devices.

**General Aniline Works, Inc.,** 1150 Broadway, New York, manufacturer of industrial chemicals, etc., has revised plans for three-story addition, 50 x 115 ft., to plant at Grassell, N. J., including improvements in present factory. Cost over \$45,000 with equipment.

**W. E. Drislane Co.,** Albany, N. Y., care of Carl J. Kiefer, Schmidt Building, Cincinnati, consulting engineer, has plans for new distillery and soon begins installation of equipment. Cost over \$50,000 with machinery.

**Wilson-Jones Co.,** 3300 Franklin Boulevard, Chicago, manufacturer of loose-leaf devices and filing equipment, has let general contract to Slonk Construction Co., 810 Canton Street, Elizabeth, N. J., for one-story addition to plant at Elizabeth, 42 x 150 ft. for storage and distribution. This will be second unit of new Eastern branch factory being built on site noted. Two other structures will be erected. Entire plant will cost over \$75,000 with equipment. Leo Caproni, New Haven, Conn., is architect and engineer.

**Borough Council,** Princeton, N. J., has plans for new municipal incinerator plant. Financing for \$35,000 has been arranged. I. Russell Riker is borough engineer.

**Continental Products, Inc.,** Newark, N. J., has been organized by Edwin J. Barry and John F. Duffey, to manufacture iron and steel and other metal products. Company will take over Continental Products Co., 24 Edison Place.

**Common Council,** Vineland, N. J., plans pumping plant for extensions in water supply system. Cost \$35,000. Financing has been arranged. Remington, Vosbury & Goff, Camden, N. J., are consulting engineers.

**Bureau of Yards & Docks,** Navy Department, Washington, asks bids until Dec. 13 for new air-conditioning system at Philadelphia Navy Yard (Specification 7373).

**Reading School District,** Reading, Pa., plans manual training departments in new junior high schools, and will soon take bids on general contract. Cost over \$700,000. Bond issue of \$2,000,000 is being arranged for this and grade school construction.

**Borough Council,** Fleetwood, Pa., plans municipal electric light and power plant. Bonds for \$115,000 have been authorized and Federal loan is being arranged.

**Penn York Distilleries, Inc.,** Shrewsbury, Pa., recently organized, is arranging for sale of stock for \$725,000, part of fund to be used for extensions and improvements in plant, including additional equipment. Company has taken over a former distillery, idle for several years. George H. Klinefelter, Railroad, Pa., is president.

## ◀ SOUTH CENTRAL ▶

**City Council,** Sheffield, Ala., will build transmission line to Government hydroelectric power development at Muscle Shoals, Ala., with substations and electric distributing system. Cost \$230,000. Financing has been arranged.

**R. L. Crigler,** First National Bank Building, Covington, Ky., is at head of project to erect a liquor rectifying and blending plant on three-acre tract now being acquired, to include storage and distributing units, and power house. Cost over \$75,000 with equipment.

**Board of Public Works,** Nashville, Tenn., plans municipal incinerator plant. Cost about \$100,000 with machinery. Bonds have been approved.

**Tennessee Valley Authority,** Muscle Shoals, Ala., Arthur E. Morgan, chairman, has engaged Stone & Webster Engineering Corp., 49 Federal Street, Boston, to design and supervise erection of new fertilizer plant at nitrate works No. 2. Cost about \$4,000,000 with equipment.

**Brown-Forman Distillery Co.,** 1908 Howard Street, Louisville, is arranging for stock issue, part of proceeds to be used for plant extensions and improvements, for which plans have been completed by L. V. Abbott, 8 Kenwood Village, city, architect.

**Common Council,** Florence, Ala., plans transmission line to Government Wilson dam hydroelectric power development, with substation and

electric distribution system for local service. Cost \$486,000. Financing is being arranged.

**K. Taylor Distilling Co., Inc.,** Frankfort, Ky., Kenner Taylor, president, is planning stock issue of \$1,125,000, part of fund to be used for extensions and improvements in former Frankfort Distillery, Forks of Elkhorn, near Frankfort, recently acquired, including new equipment.

## ◀ BUFFALO DISTRICT ▶

**Board of Education,** 13 South Fitzhugh Street, Rochester, N. Y., plans manual training department in new multi-story high school. Cost \$1,490,000 with equipment. Financing has been arranged through Federal aid.

**Techni-Seal, Inc.,** Batavia, N. Y., recently organized by Ward B. Manchester, 50 Tracy Avenue and Homer A. Harvey, 123 Union Street, has taken over local factory for manufacture of labels, seals and kindred products.

**Allegheny Refineries, Inc.,** Bolivar, N. Y., Neil S. Sullivan, secretary, recently organized, is completing work on first unit of new oil refinery for capacity of 750 bbl. a day. Divisions will be established for production of gasoline, naphtha, kerosene, distillate and steam refined stocks.

**Dorval-Siscoe Gold Mines, Ltd.,** Toronto, Ont., John T. Tebbutt, president, is arranging for sale of stock for \$125,000, part of fund to be used for expansion, to include equipment.

## ◀ WESTERN PENNA. ▶

**Forest Oil Corp.,** Bradford, Pa., is considering extensions and improvements in oil refinery. Cost over \$75,000 with equipment. K. B. Nowells is chief engineer.

**Monongahela-West Penn Public Service Corp.,** Fairmont, W. Va., plans transmission line from New Cumberland to Pughtown, W. Va., for electric light and power service at latter place.

**City Council,** Wheeling, W. Va., is planning municipal incinerator plant. Cost over \$75,000 with machinery. J. J. Gilligan is chairman of committee in charge.

**City Council,** Franklin, Pa., will soon take bids for new steel storage tank, about 550,000-gal. capacity, for municipal water system. Financing is being arranged.

**West Penn Power Co.,** West Penn Building, Pittsburgh, plans transmission line from point near Emporium, Pa., to Driftwood, Pa., about 15 miles. Cost over \$35,000 with equipment.

## ◀ SOUTHWEST ▶

**Goetz Brewing Co.,** St. Joseph, Mo., has plans for new brewery, to include storage and distributing buildings, power house, machine shop and other structures. Cost over \$350,000 with machinery. George L. Lehle, 111 West Washington Street, Chicago, is architect and engineer.

**Blackwell School District,** Blackwell, Okla., plans manual training department in new multi-story high school. Cost \$228,000 with equipment. Financing is being arranged. L. I. Shumway, Alexander Building, Tulsa, Okla., is architect.

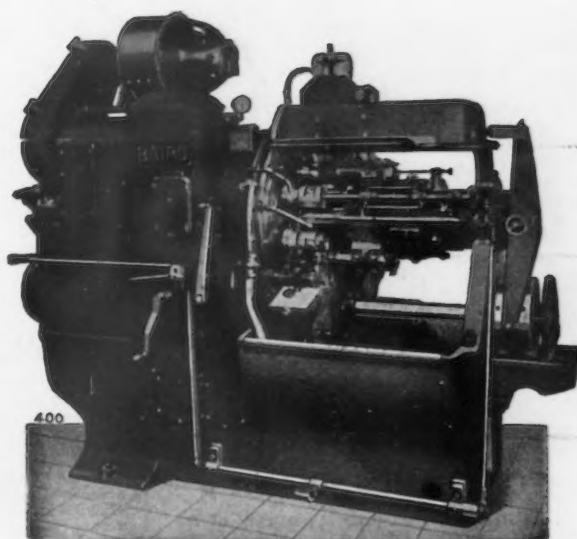
**Green Tree Breweries, Inc.,** St. Louis, Christian Buehner, 2421 South Eighteenth Street, president, is arranging for sale of stock for \$168,750, part of proceeds to be used for expansion.

**Skelly Oil Co.,** Tulsa, Okla., plans new natural gasoline plant at oil properties near Cunningham, Kingston County, Kan., including booster station, storage and distributing units, and other structures. Cost over \$200,000 with equipment.

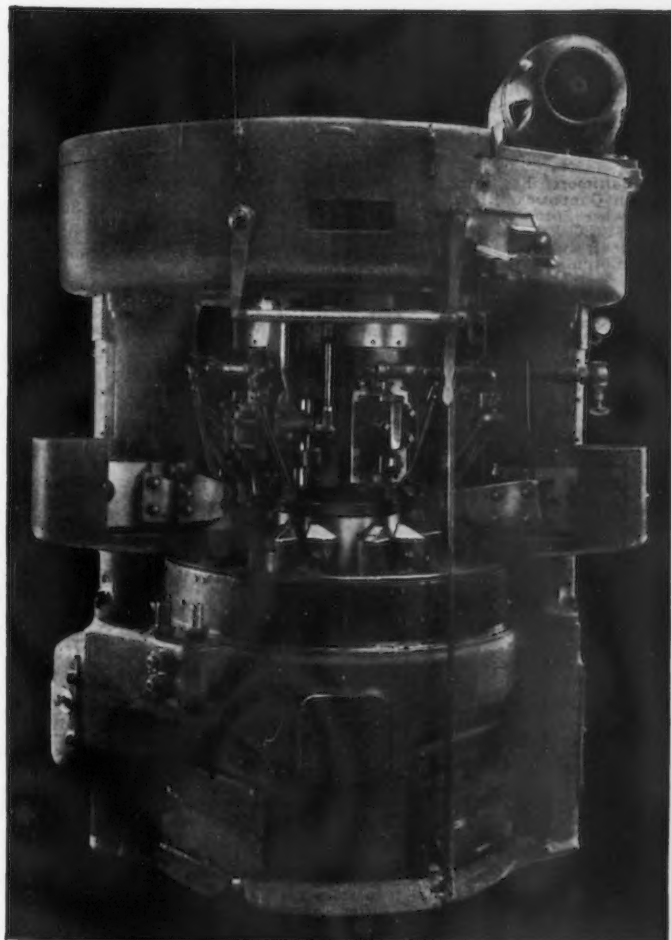
**Common Council,** Potosi, Mo., plans municipal electric light and power plant. Cost about \$64,000 with equipment. Financing is being arranged. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

# Four Reasons Why You need BAIRD Automatic Lathes BAIRD Automatic Grinders

- 1** AUTOMATIC MECHANICAL CHUCKS
- 2** AUTOMATIC AND SAFETY CONTROLS
- 3** VARIABLE SPEEDS AND FEEDS
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BAIRD 7" SIX SPINDLE HORIZONTAL



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Baird Automatic Multiple Spindle Lathes are capable of low cost production on chucking and centered work.

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"BAIRDS" are built accurately to stay accurate throughout their normal life. Here are four excellent reasons why you could profitably consider Baird machines for meeting your production problems of today.

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**THE BAIRD MACHINE CO.**  
BRIDGEPORT, CONN.

Danciger Oil Co., W. T. Waggoner Building, Fort Worth, Tex., has approved plans for new gasoline refinery near Pledger, Tex. Cost about \$85,000 with equipment.

Hiotane Refining Co., Kilgore, Tex., and Southport Petroleum Co., same place, associated, have approved plans for new gasoline refinery, to be operated in conjunction with local oil topping plant, to include gasoline storage and distributing division. Cost about \$100,000 with equipment. Emil Geppelt, 3245 Stanford Street, Dallas, Tex., is engineer.

Charles Werner will erect a new one-story machine shop and metal specialties plant, 40 x 150 ft., to cost \$5,000, at 2019 North Broadway, St. Louis. About \$6,000 will be expended for machinery and other equipment.

## ◀ SOUTH ATLANTIC ▶

Columbia Railway & Navigation Co., Columbia, S. C., plans new hydroelectric generating plant on Cooper River, near Pinopolis, S. C., in connection with navigation project on Cooper and Santee Rivers. Plant will be tied-in with new transmission system for service in Berkeley, Calhoun, Orangeburg and other counties. Project will include power substations and switching stations, with electric substations lines. Cost about \$34,000,000. Financing with Federal aid is being arranged.

Carolina Truck & Trailer Co., Charlotte, N. C., has been organized by F. H. McIntyre, Charlotte, and W. H. Powlas, Black Mountain, N. C., capital \$50,000, to manufacture motor trucks, trailers, parts, etc.

Town Council, Hartsville, S. C., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal water system. Cost about \$75,000. Ryan Engineering Co., Columbia, S. C., is engineer.

Southern Brewing Co., Tampa, Fla., recently formed by Charles A. McKay, 2910 Hawthorne Road, and associates, has plans for remodeling four-story building at Pierce and Zack Streets, to be converted for a brewery. Cost over \$125,000 with machinery.

## ◀ OHIO AND INDIANA ▶

Zoar Brewery, Inc., Zoar, Ohio, care of Albrecht & Wilhelm, 1900 Euclid Avenue, Cleveland, architects, has let general contract to C. E. Boyd Co., Masillon, Ohio, for new three-story and basement plant, including boiler house. Cost close to \$100,000 with equipment.

City Council, Defiance, Ohio, is arranging financing for \$350,000 for new municipal electric light and power plant. R. Husselman, Hippodrome Building, Cleveland, is consulting engineer.

Rex Brass Co., Inc., Cleveland, has been organized by Charles E. Sampliner and Paul Blasie, East Ohio Gas Building, to manufacture brass, bronze and kindred metal goods.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Dec. 13 for 11 compressor lubricators (Circular 159); until Dec. 19, 21 cylinder and valve assemblies (Circular 163).

John W. Little, 323 Plymouth Building, Cleveland, architect, has plans for new distillery for company whose name is temporarily withheld, to include storage and distributing buildings, boiler plant and other departments. Site is being secured in Cuyahoga County, near city. Cost over \$100,000 with equipment. Wallace W. Leipner, first address noted, is engineer.

Carthage Distilleries Corp., 7818 Anthony Wayne Avenue, Carthage, Ohio, has let general contract to Frank Messer & Sons, Inc., 2543 Burnet Avenue, Cincinnati, for new storage and distributing plant. Cost over \$100,000 with equipment. Same contractor has also secured general award for new bottling works at Reading, Ohio, including remodeling present unit. Cost about \$65,000 with equipment. L. V. Abbott, 8 Kenwood Village, Louisville, is architect. Company is a subsidiary of National Distillers Products Corp., 52 William Street, New York.

Ermet Products Co., 2100 Carolina Avenue, Indianapolis, manufacturer of electric storage batteries and other electrical products, has let general contract to J. G. Messer, Architects' and Builders' Building, for rebuilding part of plant recently damaged by fire. Cost close to \$70,000 with equipment.

Ray-Glo-Corp., Athens, Ohio, manufacturer of gas appliances and equipment, has taken over building at Shelbyville, Ind., and will remove to that location, where increased produc-

tion will be arranged. Robert Cuyler, manager, will continue in such capacity.

Berghoff Brothers Brewery, Inc., 1025 Grant Street, Fort Wayne, Ind., is planning stock issue of \$275,000 part of fund to be used for expansion. General contract has just been let to Max Irmischer & Sons, First National Bank Building for one-story dryer department. Pohlmeier & Pohlmeier, Fort Wayne, are architects.

## ◀ MICHIGAN DISTRICT ▶

Benton Harbor Brewing Co., Benton Harbor, Mich., has plans for remodeling multi-story building for new plant, including erection of addition. Brew-house, bottling, conveying and other equipment will be installed. Cost about \$100,000 with machinery. M. F. Strauch, 3863 Lincoln Avenue, Chicago, is architect.

Kellogg Co., Battle Creek, Mich., manufacturer of cereals, has plans for four-story and basement addition, 95 x 102 ft., to plant at London, Ont., for storage, packing, distribution and other service. Cost over \$85,000 with equipment. Plans are also under way for four-story factory at Brantford, Ont., cost about \$100,000 with machinery. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Orion Auto Equipment Co., 1905 Industrial Bank Building, Detroit, has been organized by Richard S. M. Mitchell, 7366 Dunedin Avenue, capital \$200,000, to manufacture automotive devices and equipment.

Fruehauf Trailer Co., 10940 Harper Avenue, Detroit, manufacturer of motor trailers, parts, etc., has work under way on one-story addition, about 40,000 sq. ft. floor space, for production of commercial truck bodies, including parts and assembling.

## ◀ WASHINGTON DISTRICT ▶

Central Metal & Rubber Co., 2115 Brunt Street, Baltimore, manufacturer of metal specialties, etc., has let general contract to A. Demb, 2036 East Baltimore Street, for new two-story plant.

Town Council, Luray, Va., plans new municipal electric light and power plant. Cost \$120,000 with equipment. Financing is being arranged.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Dec. 12 for quantity of automobile parts (Circular 59).

Wight Distilling Co., Baltimore, has work under way on new plant on Gunpowder River, near Philadelphia Road, where property has been secured. Cost about \$100,000 with equipment. General contract recently was let to Engineering-Contracting Corp., 504½ St. Paul Street.

Procurement Division, Veterans' Administration, Washington, asks bids until Dec. 11 for presses and air compressor (Proposal 267-M).

City Council, Williamsport, Md., plans installation of pumping machinery and auxiliary mechanical equipment, digesters, screens, etc., in new sewage treatment plant. Fund of \$88,000 is being arranged, to include improvements in sewerage system. Whitman, Requaardt & Smith, Baltimore Trust Building, Baltimore, are engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 12 for valves, faucets, etc. (Schedule 1131) for different navy yards.

## ◀ MIDDLE WEST ▶

Chicago Flexible Shaft Co., 5600 Roosevelt Boulevard, Chicago, manufacturer of flexible shafts and equipment, has awarded general contract to J. Wasilewski, 4903 Elston Avenue, for one-story addition, 28 x 125 ft. Samuel Crowen, 221 North LaSalle Street, is architect.

Chicago Great Western Railroad Co., 122 South Michigan Avenue, Chicago, has plans for new one-story engine house, 48 x 165 ft., with repair and reconditioning facilities, at Hayfield, Minn. Cost about \$28,000 with equipment.

Platte Valley Power & Irrigation District, Lincoln, Neb., care of C. Robert Fulton, Lincoln, engineer, has secured Federal loan for \$7,500,000 for hydroelectric power and irrigation development project on North and South Platte Rivers, near Sutherland, Neb. It is proposed to ask bids for power dam, power house, generating machinery and auxiliary equipment

in January. Program will include series of electric-operated pumping plants. Harry Williams, Gothenburg, Neb., is president.

City Council, Hastings, Neb., plans extensions and improvements in municipal electric light and power plant, including new 26-ton overhead crane. Cost about \$25,700. Financing is being arranged. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Common Council, Glenwood, Minn., is arranging Federal loan for \$140,000 for new municipal electric light and power plant, and plans to begin work soon. Burlingame & Hitchcock, Sexton Building, Minneapolis, are consulting engineers.

School District No. 1, Helena, Mont., E. M. Hall, chairman, board of trustees, plans manual training department in new three-story high school. Fund of \$425,000 has been authorized. Norman McKay, 430 Holter Street, is architect.

## ◀ PACIFIC COAST ▶

Grossmont Union High School District, Grossmont, Cal., has plans for new one-story manual arts building. Fund of \$100,000 is being arranged for this and another structure. Frank L. Hope, Jr., Commonwealth Building, San Diego, Cal., is architect.

United States Park Service, 525 Market Street, San Francisco, has plans for one-story machine shop at General Grant National Park, Tulare County, Cal. Engineering department, address noted, in charge.

Northwest Distilleries, Inc., 1733 Westlake Street, Seattle, Barney B. Lustig, president, has plans for extensions and improvements in two-story building, location noted, for new plant. Cost over \$60,000 with equipment. Carl Siebrand, 5016 Twenty-first Street, N. E., is architect.

Gray Automatic Machine Co., Inc., Vernon, Los Angeles, has been organized by Cornelius Gray, Walnut Park, Cal., and Frank M. Beeson, care of G. Harold Janeway, Title Insurance Building, Los Angeles, to manufacture special machinery and parts.

Analy Union High School District, Sebastopol, Cal., plans manual arts building at new high school group. Cost about \$240,000. Financing is being arranged. Louis Stone and J. R. Rowell, associated, 98 Ramona Street, Piedmont, Cal., are architects.

H. C. Sommer, Commercial Welding Co., 2750 East Norton Avenue, Lynwood, Cal., is at head of a project to erect one-story brewery on Drury Lane, where site has been secured. Cost about \$45,000 with equipment.

Shell Chemical Co., Shell Building, San Francisco, has plans for new one-story plant at Shell Point, Pittsburg, Cal., 65 x 120 ft. for processing, storage and distribution. Cost about \$40,000 with equipment.

United States Engineer Office, Seattle, asks bids until Dec. 30 for six gate-operating machines at Lake Washington ship canal.

Wunder Brewing Co., 2119 Linden Street, Oakland, Cal., has authorized plans for extensions and improvements, including new equipment. Cost about \$150,000 with machinery. A. R. McLaren, 611 Howard Street, San Francisco, is engineer.

## ◀ FOREIGN ▶

Mexican Zinc Co., Mexico, D. F., has secured Government concession for new zinc refinery and by-products works at San Juan de Sabinas, near Saltillo, Coahuila State, for sulphuric acid and allied production, to include power house, pumping plant, machine shop and other structures. Cost about 2,500,000 pesos (\$500,000) with equipment.

Dornier Airplane Works Ltd., Lake Constance, near Friedrichshafen, Germany, manufacturer of airplanes, seaplanes and parts, plans new works near Travemuende, Wismar Bay, on Baltic Sea. Plant will include complete department for parts production and assembling, with experimental and testing works. Present plant will be removed to new location and production concentrated at that point.

Australian Steel Co., Ltd., Sydney, New South Wales, Australia, has plans for new mill, to cost over \$500,000 with equipment. Dennis L. Benbow, New Philadelphia, Ohio, formerly connected with Trumbull Steel Co. and Empire Steel Co., will supervise erection and equipment installation, and will leave for Sydney this month. Bulk of machinery will be purchased in United States.

# HUSKIES



• Light weight rolled Monel Metal pickling room equipment, good as new after four years service. These WEAVER baskets, designed for the Budd Wheel Co., Detroit, are constructed entirely of standard rolled Monel Metal parts for 3,000 lbs. load of pressed steel auto wheel discs... Monel Metal pickling carriers designed and built by KLAAS MACHINE & MANUFACTURING COMPANY, 4313 East 49th St., Cleveland, Ohio.

## 15 TIMES THEIR OWN WEIGHT CARRIED SAFELY . . . IN BOILING ACID . . . IN THESE LIGHT WEIGHT MONEL METAL BASKETS

• Never let anyone tell you that pickling equipment must be heavy and cumbersome in order to be strong and durable. "Excess baggage" in the pickling department went out when Monel Metal equipment came in!

Consider these two Monel Metal pickling baskets. They're comparatively light in construction—yet they easily carry loads 15 times their own weight. After four years of constant daily service, they are still in perfect condition. Thanks to Monel Metal's rugged strength and high corrosion resistance, they don't show a sign of weakness—or even appreciable wear!

Note also their ingenious construction

which emphasizes Monel Metal's ready adaptability. Although these sturdy baskets were designed to meet the user's individual requirements, they are built entirely of standard rolled Monel Metal flats, angles, bolts and rivets. These parts, together with Monel Metal hooks, chain, tie-rods, wire and many other items used in the pickling room, are all available from stock.

Your regular fabricator or sheet metal contractor will tell you how Monel Metal equipment can pare down costs in your pickling department. Consult them—or write us.



Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.



THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

## Hours and Wages Hold Fairly Stationary

**C**HANGES in employment conditions in October were less marked than in recent months, according to the monthly surveys of the National Industrial Conference Board, New York.

Average hours of work fell from 36.8 in September to 36.2 hours in October, or 1.6 per cent. An increase of 1.7 per cent in average hourly earnings, however, from 53.1 cents to 54.0 cents, offset the decline in hours of work, with the result that average weekly earnings remained stationary at \$19.46. Since there was little change in the cost of living of wage-earners in October, real weekly earnings also remained practically the same.

## Issues Data Chart on Stainless Steels

**A** DATA chart on its corrosion and heat-resisting steels has been issued for general distribution by the Ludlum Steel Co., Watervliet, N. Y. In convenient form are listed the properties and characteristics of the various Ludlum Silchrome steels. Besides the physical properties and the chemical constituents, the information

covers such items as thermal conductivity, electrical resistance and melting and scaling points. Included are 12 and 17 per cent chromium steels, the company's RA steel, also the 18 and 8, silchrome H-17, which is a 17 per cent chromium steel with 1 per cent carbon for high hardness and corrosion requirements, and the 46-M, which contains molybdenum.

## New Departure Retires Preferred

**T**HE New Departure Mfg. Co., a subsidiary of the General Motors Corp., with plants in Connecticut, is to retire its \$500,000 outstanding preferred stock at \$115 a share on Jan. 1, next. After that date the company's capitalization will consist of \$2,500,000 in common stock, all of which is owned by the parent organization. The preferred stock was sold to the investing public in 1910, and has been redeemable since 1915.

## Hughes Tool Workers Vote Against A.F. of L.

**W**ASHINGTON, Dec. 5.—"American Federation of Labor representation was rejected 1000 to 600, with both sides cheerfully accepting the results."

The foregoing telegram was received yesterday by the National Labor Board from John D. Moore, its technical adviser, regarding results of an election of representatives for collective bargaining at the plant of the Hughes Tool Co., Houston, Tex.

Complaint had been made to the Board by the International Association of Machinists that the company was discharging men for joining the machinists' union. The Houston Trade and Labor Council considered the situation as serious and advised that it was agreeable to all parties, including the management, to have an election supervised by the National Labor Board.

## OBITUARY

(Continued from Page 32)

equipment and organized the Binks Spray Equipment Co. He retired from active business in 1928, at which time the new owners of the company changed the name to Binks Mfg. Co.

♦ ♦ ♦

**JOHN NELSON**, New England editor for THE IRON AGE from 1903 to 1916, died of pneumonia at his home in Worcester, Mass., on Nov. 28, aged 67 years. He attended Worcester Polytechnic Institute and in 1890 joined the staff of the *Gazette*. Seven years later he went to the Worcester *Telegram* and remained there until he joined the staff of THE IRON AGE. He returned to the *Gazette* staff in 1916 handling financial and business news.

♦ ♦ ♦

**HILEY ONSTOTT**, purchasing agent of the Acme Steel Co., Chicago, died at his home in that city on Nov. 16, aged 59 years. Prior to his going with the Acme company in 1913, he was connected with the Simmons Hardware Co., the Norvell-Shapleigh Hardware Co., and the Tenk Hardware Co.

♦ ♦ ♦

**CHARLES G. KELLOGG**, works manager of Bauer Brothers Co., Springfield, Ohio, died in that city on Nov. 19.

♦ ♦ ♦

**ALEXANDER M. HUGHES**, traffic manager of the Pittsburgh office of the Bethlehem Steel Co., died at his home in Ingomar, Pa., on Nov. 25.

♦ ♦ ♦

**JOHN HOWARD WEBSTER**, president-treasurer of the former Variety Iron & Steel Works Co., Cleveland, died Nov. 25, aged 87 years. Born in Portsmouth, N. H., he was taken to Cleveland by his parents in 1850 and after his graduation from Yale College in 1868 he studied law and later practiced that profession until he gave it up to devote his time to the Variety company.



This G. P. & F. stamped base replaced casting at big saving.

### Ask G. P. & F. to Quote on Your Stampings

If you are changing the appearance of some of your products or adding new ones—take advantage of our half century of experience in stamping and forming metal.

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Call on G. P. & F., get suggestions—estimates. In the 19-acre G. P. & F. plant you will find facilities for producing stampings of all sizes and materials.

\* Ask for booklet—"In Harmony with Modern Progress"

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## STAMPINGS



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99.99+% purity in *every* slab of

ANACONDA *Electric Zinc*



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This high standard of purity is guaranteed by Anaconda . . . world's largest Zinc producer. Uniformity in *every* slab is assured by the electrolytic refining process—pioneered and developed by Anaconda. Anaconda Electric Zinc is supplied in 50-lb. slabs, each one clearly marked "ANACONDA ELECTRIC 99.99+%". Whenever this well-known brand is used for the base of Zinc die castings, you are certain of obtaining uniform, dependable metal.

## CADMIUM

Cadmium plating gains new adherents every year. For this and other applications throughout industry, Anaconda Cadmium 99.95% pure is widely used.



# UNITED METALS SELLING COMPANY

25 Broadway, New York

# To Rationalize Investment, Destroy Surplus Capacity

(Concluded from Page 17)

(workers having had opportunity to accumulate reserves in busy season).

- (d) Estimate the actual surplus capacity in the industry, over and above a safe reserve of about 20 per cent.
- (e) Formulate retirement and control plan for equipment.

It must be recognized that retiring surplus equipment, as defined above, does not diminish opportunity of work. Machines which would be retired would in any case be idle. To destroy them does not involve the destruction of any real values; indeed, there will be a net capital gain by reason of salvage of scrap value and decreased maintenance on the total. It is, of course, possible, and probable, that the average efficiency of operation will be increased; that is a separate question and will be mentioned presently.

## Compensation for Retirement

To actually accomplish the retirement of excess capacity, a compensation fund would be required; this should be raised by the industry itself, since it will be the principal beneficiary. It might be arranged by setting up a valuation scale for the machinery according to models and age. Knowing how much is to be retired, it should not be difficult to gage the total fund required. This would be divided by the number of key machines to remain in operation and thus determine the amount of fee to be charged for license to operate. The entire amount would then be opened to bidding by the members of the industry. If the fees and retirement offers are well gaged, the amount of machine licenses bid for would be within scaling distance of the amount available. Receipt of insufficient bids would indicate too high a set of retirement values; those would have to be carefully revised and then fresh bids invited.

The license should be made to run for as long a term as possible, say two years to begin with, and rather longer as soon as the legal situation permits. The license should be transferable with the equipment, but with a limit on acquisition by any one group. When the planning council of the industry sees a need for expansion, it could allot a definite percentage to each member, making the "expansion rights" salable. An industry could by this means provide for self-regulation of capacity, for compensated surrender of weak units, and against unwise expansion. By the proposed method of liquidation, cash would only be transferred to balance

differences between "quota" and the amount of licenses bid in.

Under such a competitive franchise system, we would do away with the worst evils of business anarchy, yet retain the benefits of competition in technique. There would be no prohibition of new members in any industry, but a newcomer could not erect excessive capacity and so destroy the value of the property of others. Instead, he would have to bid in an existing amount of licensed equipment; if he then desired to scrap it and replace it with an equal capacity of better equipment, that would be his privilege.

## Rationalizing Replacement Policies

Patently the physical destruction of surplus old equipment would result in consolidated organizations which would each be reasonably sure of a steady flow of work. Each would then be in a position to set up a rational program of machinery renewal and replacement, incidentally making for greater stability in the capital-goods industries. Instead of demanding 100 per cent return on equipment, so as to be "out" of his commitment in a year, Mr. Forsythe would be more likely to go back to the 30 per cent return which satisfied him a few years ago. Machinery would be bought to be worked rather strenuously for three or four years and then junked. Instead of selling second-hand machines to a second-class operator to make cut-throat competition, it would be sold to the steel industry to re-melt and re-make into newer machines which would deliver more to owner, worker and consumer. Such a program of protected investment would make it feasible to expand credit in places where it is now either unwanted or unsafe. Conversely, there would be restraint against the simultaneous over-expansion and over-extension of credit which has previously occurred in times of prosperity.

If more rapid technological advance is thus made practicable in the low-wage industries—and it is worth noting that in 1929 half our wage-earners were in industries which, all told, paid an average wage of only \$1,100, while the other industries paid \$1,560—then increasing the payroll ceases to be an insurmountable obstacle. To ensure that each industry pull its own weight, it should be stipulated that, in return for the protection of the license, the benefits should be shared with the workers, by raising minimum wages in proportion to the average feasible increase of productive efficiency. In that way we can ensure that added

productivity will put new consuming power into circulation.

## Improvement in Sales Relation

Not least, the very process of organizing production on a rational basis would be a first-class labor-saving device in the sales department. With only limited surplus capacity, and greater equilibrium between seller and buyer, there would be little incentive to destructive competition. The cost of making last-minute changes in production arrangements, to make up for buyers' procrastination, is an item on which any factory manager can speak feelingly. With the salesman's work less bogged down by chicanery, its constructive aspect of market development would come more to the fore.


Admittedly, not every industry would be able to organize itself along the lines proposed. Even those industries which could adopt licensing methods might have to develop methods varying in many details from the one outlined. But if a substantial group could so achieve self-regulation and comparative stability, that of itself would tend to stability of related industries and to support of general consuming power. It might then be later possible for others to undertake a program of rationalization which they now feel to be impossible as long as they have nothing to which to anchor.

The Kelpo free-wheeling or one-way industrial clutch has been acquired by the Morse Chain Co. division of Borg-Warner Corp. This clutch has been a product of the Kelpo Clutch Co., Rockford, Ill. In the future, the Kelpo clutch will be manufactured at the Ithaca, N. Y., plant of the Morse company and will be sold by Morse representatives. Frank M. Potgieter, formerly president of Kelpo company, has joined the Morse organization.


The World War cost a sum equal to about \$200 a minute from the administration of Julius Caesar to the present period. In an unconventional, non-conformist, and entirely readable analysis of the requisites for recovery, "The Economics of Recovery," by Leonard P. Ayres, published by The Macmillan Co., the late industrial debacle is traced to the financial burden arising from the World War. Much of the book is devoted to a critical discussion of the new emergency legislation, and to the problems of inflation and of foreign trade. The author maintains that little monetary reaction would follow reduction of dollar gold content, printing of greenbacks to retire Government bonds, or moderate issues of fiat money. Fundamental recovery is shown as dependent upon a broad banking reform, expansion of private enterprise in profit-making activities, and the adoption of a definite, reliable money policy.

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**102.2%**  
PRODUCTION  
INCREASE  
1/2" Round, Cold Drawn  
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Special High Sulphur  
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**5%**  
PRODUCTION  
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3/8" Round, Cold Drawn  
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**J & L**  
*Improved*  
**BESSEMER  
SCREW STEEL**

NO CHANGE IN CHEMISTRY  
OR PHYSICAL PROPERTIES



**20%**  
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3/8" Round, Cold Drawn  
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S.A.E. 1112



**18%**  
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**T**HE radical improvement in the machining quality of J & L Improved Bessemer Screw Steel is reflected in the production increases secured in making the parts shown. In addition, improved appearance was obtained. These are but a few of the many cases reported to us. This improved machinability is found in both S.A.E. 1112 and J & L Special High Sulphur Bessemer Screw Steel, in hot rolled bars, cold finished bars, and drawn wire. Write for descriptive bulletin.



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Warehouses: CHICAGO CINCINNATI DETROIT MEMPHIS NEW ORLEANS PITTSBURGH  
Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

## TRADE PUBLICATIONS

**Milling Cutters.**—Goddard & Goddard Co., Inc., Detroit. Large loose-leaf catalog "D" is profusely illustrated and complete with prices, sizes and standardization of types. The catalog serves as handbook for users of milling cutters, reamers and hollow mills. A large section is devoted to applications of special milling tools to various processes in order to improve finish or speed production.

**Zinc Die Casting.**—Jersey Zinc Co., 160 Front Street, New York. Booklet describes the applications, advantages and possibilities of using zinc die castings.

**Corrosion and Heat Resisting Alloys.**—Republic Steel Corp., Massillon, Ohio. New "Enduro 4-6 per cent Chromium Steels" booklet gives large fund of information regarding different alloys and their respective uses as resisters of corrosion, acid attack and sealing at elevated temperatures. Also shows adaptability to rolling, forming, drawing, forging, welding and riveting.

**Motors and Generators.**—Crocker-Wheeler Electric Mfg. Co., Ampere, N. J. Illustrated booklet shows a complete line of motors, motor generator sets, speed changers, couplings and torque meters.

**Pipe and Tubing.**—Babcock & Wilcox Co., 80 Liberty Street, New York. Illustrated bulletin presenting manufacture and characteristics of new class of seamless tubular products. Small size tubes are made by hot finishing, and inside finish is said to be scratch-free. Pipe and tubing have uniform wall thickness, and are available in sizes that formerly required cold drawing.

**Concrete Pipe.**—Universal Concrete Pipe Co., 297 South High Street, Columbus, Ohio. Large illustrated book giving physical characteristics, applications and methods of installing concrete pipe for sewers and culverts.

**Compressors.**—Worthington Pump & Machinery Corp., Harrison, N. J. Folder describing construction and application of improved, single stage, horizontal, steam or motor driven air or gas compressor.

**Screws, Bolts and Nuts.**—Pheoll Mfg. Co., 5700 Roosevelt Road, Chicago. Recently issued catalog giving complete information concerning screws, bolts, nuts and all products, including all standard items as well as special products. Reference tables, standard tolerances and miscellaneous data are also furnished.

**Electric Melting.**—Detroit Electric Furnace Co., Detroit. Illustrated book presenting uses and advantages of Detroit rocking electric furnace. Production of castings is described with numerous photo-micrographs to show grain structure of various grades of iron used in machine parts.

**Compressed Air Turbine Motor.**—Onsrud Machine Works, Inc., 3900 Palmer Street, Chicago. Impulse turbine motor, weighing 2 lb. and operating at a speed of 50,000 r.p.m. developing  $\frac{1}{4}$  hp., is described in bulletin WD-1. Industrial applications are shown.

**Water Filters.**—Graver Tank & Mfg. Corp., Chicago. Booklet describing recent developments and applications of Graver mechanical, gravity and pressure type water filters.

**Recording Meters.**—Brown Instrument Co., Philadelphia. Reduction of fuel losses, saving of combustion equipment and improved boiler efficiency are described and illustrated in folder.

**Cold-Finished Steel.**—Hamilton Steel Co., Cleveland. New handbook contains complete information on all grades of cold-finished products. Hardness and weight tables, standard specifications and general information are included.

**Washroom Equipment.**—Bradley Washfountain Co., Milwaukee. Circular describing group-washing fixtures for factories with data showing savings in water consumption, floor space and maintenance costs.

**Electric Motors.**—Louis Allis Co., Milwaukee, Wis. Small magazine describing line of multi-speed, explosion-proof, and wound-rotor motors. New splash-proof motor is fully described.

**Hydraulic Pumps.**—John Robertson Co., Inc., Brooklyn. Folder describing Robertson vertical triplex plunger hydraulic pump for installations demanding high pressure.

**Fireclay Bonding Material.**—Harbison-Walker Refractories Co., Pittsburgh. Folder illustrating uses and advantages of new "Harwaco Bond," refractoriness well over 3000 deg. Fahr., for binding all types of refractories. Increased brick life and stronger bond are claimed.

**Electric Blowers.**—Breuer Electric Mfg. Co., Chicago. Folder describing new portable electric blower for all types of cleaning work.

**Wrought Iron Forging Billets.**—A. M. Byers Co., Pittsburgh. Folder describing manufacture, improvements, and new uses for wrought iron forging billets.

**Link-Belt Co., Indianapolis.** Illustrated catalog on flexible shaft couplings. Three different types are tabulated and priced. Both revolving and stationary types of automatic-lubricating casings are included.

## TRADE NOTES

E. N. Clarson, recently connected with the Corby Supply Co. and for many years previously with Joseph T. Ryerson & Son, Inc., has become associated with Guy H. Rumpf, Railway Exchange Building, Saint Louis, handling general line of machine tools, welding equipment, industrial tractors and trucks, and steel. Mr. Rumpf represents the following companies: Bryant Machinery & Engineering Co., Mercury Manufacturing Co., Acme Steel Co., and Detroit Seamless Steel Tube Co.

The Louis Allis Co., Milwaukee, has added four new members to its sales organization as follows: C. F. Cate, 212 North Third Street, Albuquerque, N. M., in New Mexico; Robert B. Soderberg, 196 Palm Street, Hartford Conn., in Connecticut; N. O. Lawyer, working out of the company's New York office, 50 Church Street; and G. W. Conner, in the Cincinnati office at 1124 Chamber of Commerce Building.

Inland Steel Co., Chicago, has appointed A. M. Castle & Co., Chicago, exclusive sales representatives on the Pacific Coast to handle the sales of the Inland company's products through their Los Angeles, San Francisco and Seattle offices.

Malden Machine Shop, 131 Exchange Street, Malden, Mass., has changed its name to Lawson Machine & Tool Co. Chester M. Lawson is head.

Superior Steel Corp., reported for third quarter net profit of \$23,387, compared with net loss of \$74,771 in the preceding quarter, and net loss of \$174,976 in the third quarter last year. For the nine months ended Sept. 30, net loss amounted to \$223,721, against net loss of \$450,749 in the first nine months of 1932.

Central Foundry Co. and Universal Pipe & Radiator Co. have removed Chicago warehouse and sales offices to 1629 Wellington Street.

Vulcan Iron Works, Wilkes-Barre, Pa., has concentrated all its sales activities under the direction of Fred O. Smith, vice-president.

Passaic-Bergen Welders, Inc., has changed name to Passaic County Welders, Inc., and has moved to new quarters at 640 Main Avenue, Clifton, N. J., where modern welding shop has been equipped. Shop is under direct supervision of Frank W. Taft, formerly president of Passaic-Bergen Welding Works, Inc.

## Beer Kegs Made of Deep Drawing Sheet Steel

DEEP drawing sheet steel of No. 18 gage and No. 11 or 14 gage is employed for the "President" beer keg recently brought out by the Truscon Steel Co., Youngstown, Ohio, and manufactured in the company's Cleveland plant. The lighter gage



material is employed for the inner shell and the heavier, either No. 11 or 14-gage steel as desired, for the outer shell. Light weight, strength and ease of handling, as well as neat appearance, are features claimed for the "President" steel beer keg.

The exterior of the keg is vertically ribbed and has two deeply corrugated horizontal runners which fit standard conveyors and protect the bung and sides when the kegs are rolled. The chimes are reinforced by heavy steel rings to provide strength and easy gripping. The air space between the shells is packed with insulation. The inner surface is treated by a special process to bond pitch. The outside is painted brown. Complete drainage and easy cleaning and sterilization are features emphasized. A keg in the  $\frac{1}{2}$ -bbl. size weighs 68 lb.

BETTER PRODUCTS  
BETTER FINISHES  
AT LOW COST

Pre-Coated  
STRIP STEELS  
*ThomaStrip*

PRE-COATED WITH  
ZINC OR COPPER

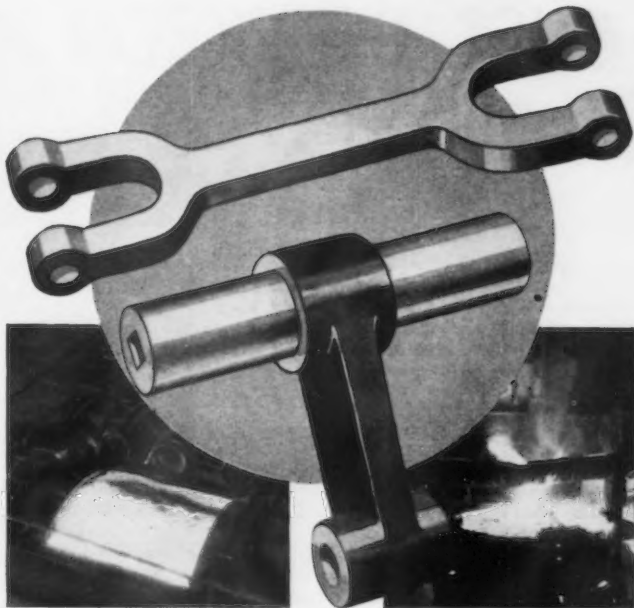


"Made from ThomaStrip" gives highest quality authority to any product that can be stamped or drawn from strip steel. Superior drawing quality, uniformity of gauge and temper that eliminates product defects and cuts costs. Dense, non-porous coating of rust and corrosion resistant zinc that serves as a final finish, or rust preventive undercoat for paint and lacquer finishes. Or fine copper coating that serves as a finish coat for indoor use, or as the bond for other platings . . . It will pay you to investigate the many advantages of specialized production ThomaStrip. Send for test samples — specify width, gauge, temper and coat desired.

*The* THOMAS  
STEEL CO.

WARREN • OHIO

SPECIALIZED PRODUCTION  
COLD ROLLED STRIP STEEL



Improve your product

with



SPECIAL HIGH GRADE

**FORGING  
BILLETS**

**T**HE best forgings are made from the best forging steel. So, for sound, dense forgings of maximum strength, able to withstand the service for which they're intended, use ASCO Forging Billets.

The quality of ASCO Forging Steel in billets and slabs results from careful selection of raw materials; processing in the furnace, tapping, teeming, and rolling under absolute laboratory control; liberal discards at the shears to eliminate all pipes and blowholes, thorough chipping, and repeated inspections.

Use ASCO Billets and be sure of the quality of your forgings. Our metallurgical laboratories are at your service in developing special steels for special purposes.

**THE ANDREWS STEEL CO.**  
**NEWPORT KENTUCKY**

Carbon  
Chrome  
Chrome Molybdenum  
Chrome Nickel  
Chrome Vanadium

Molybdenum  
Nickel  
Nickel Molybdenum  
Vanadium Billets  
Slabs

## JUST BETWEEN US TWO

You Tell Us, Frank

"JUST what does operation under the NRA mean to the Iron Age subscriber?" asks Frank Herzog, an American engineer in Russia. We'll bite.

Well, anyway, renewals (every one of them paid for) for the past five months are up 9 per cent over last year, and new subscriptions are up 67 per cent.

### Scrap

REBUILDING our trade lists requires us to read Mr. Dun's rating book. We don't quite get the plot, and he introduces too many characters. But it would be unfair to say there are not occasional bright spots.

For instance, *Vida, Mo., we learn, has a population of 2. Both members of the population are in business. Mr. Groves runs a general store and Mr. Salsman a garage.*

In Chilhowee of the same state is the National Fox & Wolf Scent Supply Co., makers of lures. What the country badly needs is a good unlure.

A local dog hospital advertises, "Cats Dry-cleaned," and a butcher near the Polo Grounds sells "Fine Fouls—29c."

### A Wow on the Way

EDITORS are cautious folk. They leave the bragging to the capable hands of the business department. So when they tell us a breath-taker is coming we sit up and take notice. They hint that the Annual Number (out Jan. 4) will be something, that it will even surpass our sumptuous 75th Anniversary Number, which established a new high Oh! and Ah! record in the trade paper field.

We sneaked into an editor's office a few days ago and saw a beautiful painting that looked to us like a picture of a nudists' convention, but we learn it is just one of a series of paintings that will appear in the Annual.

*Will you gasp!*

### But the Horse Died

AN advocate at Washington for a seasonal industry recommends that wages be not raised because it would be unfair to the workers. He says in dull times they would find it hard to readjust their living expenses.

Which reminds us of the story of the man who had just taught his horse to live on sawdust when it up and died on him.

### The Blurb of the Week

NOTHING but our indomitable will and a frantic desire to hang on to our five readers keep us from filling this column with blurb after blurb. But here's one orchid we refuse to let waste its fragrance on the desert air. The writer is an executive in one of the country's largest pump-building plants:

*"I have received many valuable ideas from the many instructive articles in your magazine—one might say a liberal education on material.*

*"The nature of my work calls for me to be in close touch with the metallurgical phases of work in the shop, so all issues of The Iron Age are routed back to my desk after their journey through the plant."*

### Find a Home for These Orphans

IF you don't route your copies through the plant, think of the countless ideas in The Iron Age that are needlessly orphaned just because they don't reach the eyes of the men who can adopt 'em. Finding the right home for good ideas turns vermilion figures into black.

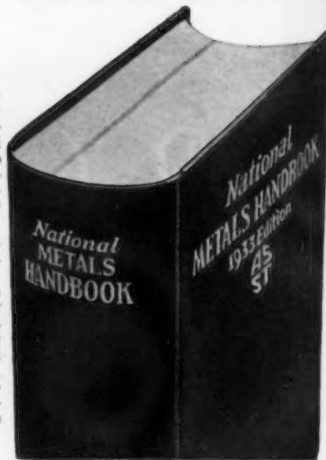
Don't delay. Take a letterhead; list the names of the men who read or should read IA. Mail it to 239 W. 39th St., N. Y. And before you've received another issue a supply of neatly printed routing forms, gummed and everything, will be in your hands.

—A.H.D.

## HERE'S THE BOOK the World of Metals has been waiting for!

Once every three years, a new edition of the National Metals Handbook is announced by its publishers, the American Society for Steel Treating. Thousands of men who are interested in metals will welcome the news that the 1933 edition of this famous book is now ready!

The new National Metals Handbook contains 1453 pages of scientific data and authentic information on 231 ferrous and nonferrous subjects. This book is generally acknowledged as the supreme authority on all questions pertaining to metals. Widely used as a text and reference book by executives, superintendents, foremen, engineers, chemists, metallurgists, instructors and salesmen who have come to regard it as,



### "The Blue Book of the Metal Industry"

The material in this new and greatly enlarged edition has been prepared by some 200 authors, men of unquestioned technical ability—leaders in their respective fields. Each of the 231 articles has been approved by the Recommended Practice Committee of the American Society for Steel Treating, publishers of the book. The following list of ferrous and nonferrous subjects included in the new Handbook indicates the widespread scope and impartial nature of this great work.

#### Partial List of Contents of New Edition

The **Ferrous Section** consists of 136 articles of approximately 900 pages. It includes 30 articles on Heat Treatment, 8 on Carburizing, 4 on Metallography, 13 on Testing and Inspecting, 13 on Steels and Alloying Elements, 8 on Chemical, Physical and Mechanical Properties of Steels and Iron Alloys, 6 on Forging, Mechanical Working, Fabrication and Processes, 7 on Melting, 7 on Fuels, Furnaces and Refractories, 12 on the Constitution of Iron Alloys besides numerous other topics such as Nitriding, Quenching, Pyrometry, Welding, etc.

The **Nonferrous Section** contains 92 articles of approximately 500 pages. This part of the book was prepared by the Committee on Data Sheets of the Institute of Metals division of the A.I.M.E. Included in this section there are 23 articles on Aluminum, 4 on Brass, 14 on Copper Alloys, 8 on Lead, 4 on Magnesium, 7 on Nickel and many others on Tin, Zinc and similar Nonferrous subjects.

The popularity of the National Metals Handbook, now in its sixth year, continues unabated. Read these enthusiastic comments by a few of its 25,000 users: **New York:** "The National Metals Handbook is a very potent factor in engineering and metallurgical calculations!" **Pittsburgh:** "The Handbook is a most valuable contribution to the work of the whole Metal Industry!" **Chicago:** "The Handbook is used by every man in our Laboratory dozens of times daily!" These unsolicited endorsements are your assurance that in sending for your copy of the new Handbook you are making a splendid investment which will yield generous dividends of increased knowledge and will equip you with a valuable tool for finding the right answer to any problem concerning the use of Metals!

**SEND FOR YOUR COPY TODAY—  
MONEY BACK IF NOT SATISFIED!**

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Iron Age Publishing Co.,  
239 West 39th St., New York

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